HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 13

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| Vegetation over TOPSOIL (Grey silty clay with frequent roots). | 0.2 | | | |
| Soft becoming firm brown very sandy silty CLAY containing occasional roots. (Possibly FILL?). | | D1/J1 | 0.5-1.0 | |
| | | D2/J2 | 1.5-2.0 | |
| | 2.6 | D3/J3 | 2.5-3.0 | |
| Firm brown becoming grey silty CLAY. (Possibly FILL?). | | | | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 6/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 14

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| Vegetation over TOPSOIL (Brown silty clay containing frequent roots). | 0.3 | | | |
| Brown slightly clayey silty SAND. (Possibly FILL?). | | D1/J1 | 0.5-1.0 | |
| | | D2/J2 | 1.5-2.0 | |
| | 1.8 | | | |
| Firm orange-brown silty CLAY. (Possibly FILL?). | | | | |
| | 2.6 | D3/J3 | 2.5-3.0 | |
| Firm green-brown very clayey silty SAND. (Possibly FILL?). | | | | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 6/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 15

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| Vegetation over TOPSOIL (Brown silty clay containing frequent roots). | 0.15 | | | |
| Firm brown slightly sandy silty CLAY. (Possibly FILL?). | | D1/J1 | 0.5-1.0 | |
| | | D2/J2 | 1.5-2.0 | |
| | 1.7 | | | |
| Firm orange-brown silty CLAY. (Possibly FILL?). | | D3/J3 | 2.5-3.0 | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 7/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 16

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| TARMAC. | 0.05 | | | |
| FILL (Grey silty clay with frequent gravel). | 0.5 | D1/J1 | 0.5-1.0 | |
| Brown silty fine to coarse SAND. (Possibly FILL?). | | D2/J2 | 1.5-2.0 | |
| | 2.2 | | | |
| Firm orange-brown very sandy silty CLAY. (Possibly FILL?). | | D3/J3 | 2.5-3.0 | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

| HARRISON & COMPANY | Trial Pit Record | | |
|---|---|---|---|
| | Location : Otford Road, Sevenoaks, Kent. | | |
| Client : British Gas (South Eastern). | Date : 7/8/92 | | Job No. : C1935/22 |
| Plant : J.C.B. Excavator | Diameter : 0.70m x 1.50m | | Trial Pit No. : 17 |

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| TARMAC. | 0.05 | | | |
| FILL (Grey silty sand with frequent gravel). | 0.3 | | | |
| FILL (Grey-black silty ashy clay containing occasional timber fragments). | | D1/J1 | 0.5-1.0 | |
| | 0.7 | | | |
| Firm brown becoming orange-brown very sandy silty CLAY. (Possibly FILL). | | D2/J2 | 1.5-2.0 | |
| | | D3/J3 | 2.5-3.0 | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 6/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 18

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| Gravel over FILL (Grey silty clay and gravel with occaisonal roots). | 0.2 | | | |
| FILL (Grey to brown slightly sandy silty clay containing frequent brick, coke and ash fragments). | | D1/J1 | 0.5-1.0 | |
| | 1.0 | | | |
| | | D2/J2 | 1.5-2.0 | |
| Firm brown very fine sandy silty CLAY. (Possibly FILL?). | | | | |
| | | D3/J3 | 2.5-3.0 | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road. Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 6/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 19

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| Vegetation over TOPSOIL (Grey slightly sandy silty clay containing frequent gravel and roots). | 0.2 | | | |
| Firm black-grey silty CLAY. (Possibly FILL?). | 0.5 | D1/J1 | 0.5-1.0 | |
| Firm brown silty CLAY. (Possibly FILL?). | 1.2 | D2/J2 | 1.5-2.0 | |
| Orange-brown silty fine SAND. (Possibly FILL?). | | D3/J3 | 2.5-3.0 | |
| Trial Pit Complete at 3.0m. | 3.0 | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

# Trial Pit Record

Location : Otford Road, Sevenoaks, Kent.

Client : British Gas (South Eastern).

Date : 6/8/92

Job No. : C1935/22

Plant : J.C.B. Excavator

Diameter : 0.70m x 1.50m

Trial Pit No. : 20

| Soil Description | Depth below Ground Level (m) | Sample Type | Sample Depth (m) | Notes (e.g. Colour, Smell) |
|---|---|---|---|---|
| | 0.0 | | | |
| Vegetation over TOPSOIL (Grey slightly sandy silty clay containing frequent roots). | 0.3 | | | |
| Firm brown silty CLAY. (Possibly FILL?). | | D1/J1 | 0.5-1.0 | |
| | 1.5 | D2/J2 | 1.5-2.0 | |
| Orange-brown silty fine SAND. (Possibly FILL?). | | D3/J3 | 2.5-3.0 | |
| | 3.0 | | | |
| Trial Pit Complete at 3.0m. | | | | |

Remarks :

Groundwater was not encountered.

Trial pit relatively stable on completion.

Key :

D : Disturbed Sample

J : Jar Sample

W : Water Sample

HARRISON & COMPANY

## SITE : SEVENOAKS

Results relate to air dried whole soil and are expressed in mg/kg, unless otherwise stated

| | | pH | Stone Content % | Loss on Ignition % | Soil Moisture Content % | PAH | Phenols | Copper | Nickel | Chromium | Zinc | Cadmium | Lead | Iron | Arsenic | Mercury | Total Cyanide | Elemental Sulphur % | Water Soluble Sulphate | Water Soluble Chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trial Pit/Borehole No. | 1 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 5.70 | 0.40 | 1.02 | 5.1 | <5 | <0.5 | <10 | 32.0 | 12.7 | 31.9 | 1.11 | 23.7 | 19718 | 4.07 | 0.02 | 9.4 | <0.01 | 33.96 | 11.81 |
| | D2 | 6.20 | 0.00 | 0.62 | 9.8 | <5 | <0.5 | <10 | 54.7 | 26.2 | 31.4 | 1.06 | 21.7 | 21029 | 2.26 | 0.10 | 1.1 | <0.01 | 25.13 | 6.80 |
| | D3 | 5.70 | 1.32 | 0.56 | 5.0 | <5 | <0.5 | <10 | 56.6 | 39.7 | 31.1 | 0.60 | <20 | 24545 | 1.58 | 0.02 | <1 | <0.01 | 28.72 | 10.23 |
| Trial Pit/Borehole No. | 2 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 6.65 | 0.81 | 0.80 | 6.0 | <5 | <0.5 | 17.4 | 20.5 | 12.6 | 32.3 | 0.50 | 23.6 | 23413 | 6.3 | 0.02 | 6.4 | <0.01 | 99.19 | 16.37 |
| | D2 | 5.95 | 0.00 | 0.75 | 10.0 | <5 | <0.5 | <10 | 13.2 | <10 | 23.3 | 0.88 | 27.5 | 11714 | 12.25 | 0.04 | 10.0 | <0.01 | 34.54 | 10.46 |
| | D3 | 6.15 | 0.53 | 0.76 | 9.4 | <5 | <0.5 | <10 | 63.9 | 23.2 | 28.8 | 0.40 | 23.7 | 24236 | 9.19 | 0.40 | 17.6 | <0.01 | 29.89 | 9.58 |
| Trial Pit/Borehole No. | 3 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 5.40 | 0.00 | 1.01 | 12.2 | <5 | <0.5 | <10 | 39.8 | 21.6 | 38.1 | 0.62 | 29.2 | 34963 | 6.28 | 0.02 | <1 | <0.01 | 61.61 | 9.77 |
| | D2 | 5.70 | 0.00 | 0.51 | 11.8 | <5 | <0.5 | <10 | 37.1 | 19.3 | 38.7 | 0.62 | 34.1 | 32559 | 3.72 | <0.02 | 13.4 | <0.01 | 33.83 | 8.57 |
| | D3 | 5.55 | 0.00 | 0.75 | 10.3 | <5 | <0.5 | <10 | 36.7 | 14.8 | 30.5 | 0.61 | 28.6 | 24873 | 9.8 | 0.10 | <1 | <0.01 | 33.25 | 9.04 |
| Trial Pit/Borehole No. | 4 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 3.30 | 0.00 | 0.78 | 15.1 | <5 | <0.5 | <10 | 29.0 | 12.3 | 32.0 | 1.08 | 32.4 | 21684 | 2.5 | 0.02 | 4.7 | <0.01 | 468.00 | 13.06 |
| | D2 | 4.00 | 0.00 | 0.98 | 15.9 | <5 | <0.5 | <10 | 67.2 | 32.1 | 40.6 | 1.23 | 57.8 | 40506 | 17.91 | 0.08 | 5.9 | <0.01 | 870.22 | 14.64 |
| | D3 | 3.90 | 0.26 | 0.34 | 8.3 | <5 | <0.5 | <10 | 42.1 | 12.9 | 30.6 | 1.24 | 24.3 | 27123 | 18.69 | <0.02 | 4.9 | 7.81 | 337.11 | 6.53 |
| Trial Pit/Borehole No. | 5 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 4.70 | 0.00 | 1.18 | 14.4 | <5 | <0.5 | <10 | 55.1 | 19.1 | 39.8 | 1.22 | 23.8 | 35025 | 4.7 | 0.05 | 0.9 | <0.01 | 100.42 | 11.85 |
| | D2 | 5.00 | 0.00 | 1.19 | 12.0 | <5 | <0.5 | <10 | 63.0 | 18.7 | 37.5 | 0.90 | <20 | 37324 | 4.6 | 0.02 | 11.9 | <0.01 | 67.35 | 8.26 |
| | D3 | 5.50 | 0.00 | 4.48 | 9.2 | <5 | <0.5 | <10 | 48.2 | 16.9 | 30.1 | 0.91 | <20 | 30203 | 2.36 | 0.02 | 21.6 | <0.01 | 32.88 | 5.70 |
| Trial Pit/Borehole No. | 6 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 3.50 | 11.99 | 3.80 | 20.5 | <5 | <0.5 | 53.8 | 41.6 | 20.1 | 119.6 | 1.58 | <20 | 30877 | 1.93 | 1.01 | 906.5 | <0.01 | 1944.41 | 13.25 |
| | D2 | 3.90 | 2.36 | 23.43 | 25.4 | 5210 | 1252.1 | 29.4 | 60.1 | 44.8 | 334.2 | 3.68 | <20 | 40111 | 2.51 | 2.52 | 10224.0 | 0.07 | 2328.03 | 15.11 |
| | D3 | | | | | | | | | | | | | | | | | | | |
| Trial Pit/Borehole No. | 7 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 6.05 | 0.00 | 18.44 | 27.8 | 1923 | <0.5 | <10 | 20.7 | 12.7 | 339.3 | 1.73 | 486.4 | 40609 | 23.25 | 14.25 | 1268.1 | 3.86 | 2978.13 | 14.87 |
| | D2 | 2.85 | 0.25 | 3.57 | 18.0 | 31 | 21.1 | 30.2 | 33.3 | 10.3 | 73.0 | 0.69 | 175.5 | 29494 | 24.94 | 0.30 | 217.2 | <0.01 | 3170.66 | 10.43 |
| | D3 | 5.15 | 0.48 | 1.73 | 12.9 | <5 | <0.5 | 11.5 | 27.1 | 20.9 | 61.1 | 0.90 | 79.9 | 31509 | 2.26 | 0.24 | 138.5 | 0.02 | 4156.88 | 10.03 |

## SITE : SEVENOAKS

Results relate to air dried whole soil and are expressed in mg/kg, unless otherwise stated

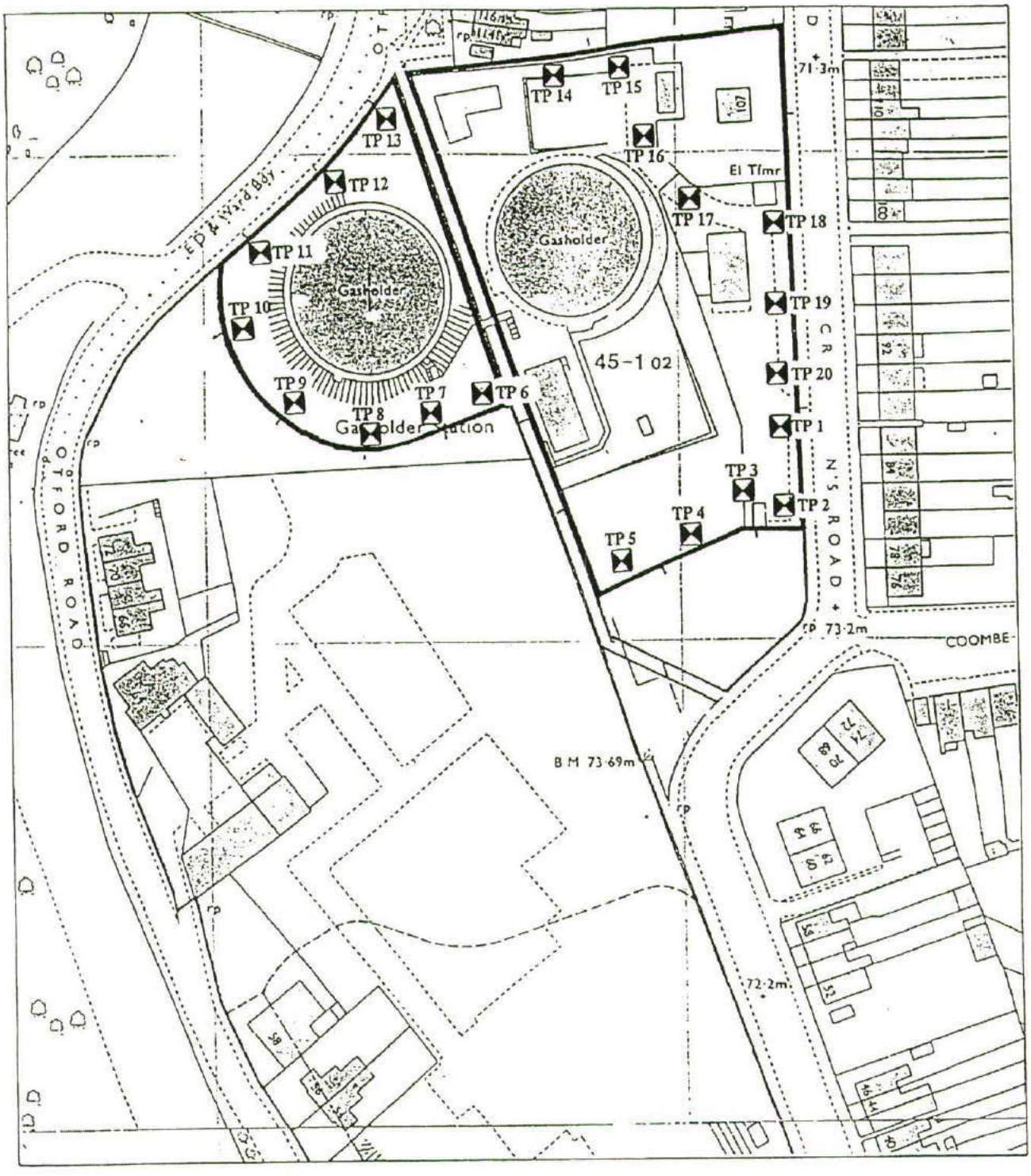
| | | pH | Stone Content % | Loss on Ignition % | Soil Moisture Content % | PAH | Phenols | Copper | Nickel | Chromium | Zinc | Cadmium | Lead | Iron | Arsenic | Mercury | Total Cyanide | Elemental Sulphur % | Water Soluble Sulphate | Water Soluble Chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trial Pit/Borehole No. | 8 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 6.50 | 0.00 | 9.45 | 26.1 | 344.6 | <0.5 | 189.2 | 113.6 | 18.5 | 374.1 | 3.06 | 856.5 | 47555 | 9.95 | 1.50 | 304.4 | 0.45 | 2261.64 | 13.98 |
| D2 | | 3.25 | 0.00 | 2.92 | 17.7 | 110.8 | <0.5 | 19.7 | 18.6 | 12.8 | 58.8 | 0.62 | 187.9 | 22817 | 9.8 | 0.19 | 162.9 | 0.71 | 3375.02 | 8.07 |
| D3 | | 3.90 | 0.00 | 1.42 | 11.5 | <5 | <0.5 | 28.1 | 42.6 | 14.5 | 39.0 | 0.73 | 83.6 | 35323 | 2.44 | 0.24 | 149.2 | 0.03 | 1904.62 | 60.22 |
| Trial Pit/Borehole No. | 9 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 3.70 | 0.80 | 1.81 | 14.8 | <5 | <0.5 | <10 | 27.5 | 19.1 | 49.4 | 1.32 | 47.7 | 30456 | 8.62 | 0.08 | 7.0 | <0.01 | 136.04 | 5.44 |
| D2 | | 6.70 | 0.00 | 1.34 | 13.9 | <5 | <0.5 | 13.4 | 42.8 | 24.9 | 77.0 | 0.50 | 42.1 | 28366 | 7.21 | 0.29 | 4.6 | <0.01 | 99.52 | 9.05 |
| D3 | | 4.90 | 8.48 | 1.87 | 15.7 | <5 | <0.5 | 98.1 | 32.3 | 12.8 | 35.1 | 0.51 | 47.9 | 21175 | 4.8 | 0.05 | <1 | <0.01 | 575.07 | 11.85 |
| Trial Pit/Borehole No. | 10 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 7.10 | 5.67 | 2.69 | 12.5 | <5 | <0.5 | 28.1 | 64.1 | 18.4 | 252.0 | 1.27 | 344.3 | 30049 | 1.89 | 0.25 | 67.4 | 0.11 | 286.68 | 12.05 |
| D2 | | 7.20 | 13.82 | 1.65 | 18.5 | <5 | <0.5 | 47.0 | 55.4 | 16.4 | 73.9 | 1.14 | 180.8 | 25.53 | 1.78 | 0.13 | 8.7 | <0.01 | 276.65 | 13.14 |
| D3 | | 7.25 | 3.83 | 3.62 | 12.6 | 2690 | <0.5 | 27.3 | 66.4 | 31.6 | 142.1 | 2.28 | 587.7 | 21802 | 1.81 | 0.18 | 2.8 | <0.01 | 479.67 | 25.39 |
| Trial Pit/Borehole No. | 11 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 6.30 | 0.00 | 16.80 | 22.1 | 3826 | 1313.1 | 179.1 | 25.5 | 10.7 | 161.6 | 1.13 | 794.8 | 28200 | 2.68 | 0.08 | 696.1 | 0.64 | 1217.73 | 17.78 |
| D2 | | 6.70 | 0.12 | 2.77 | 11.0 | <5 | 214.2 | 17.5 | 48.2 | 12.7 | 159.8 | 0.71 | 76.2 | 20280 | 6.19 | 0.06 | 9.3 | <0.01 | 26.11 | 22.04 |
| D3 | | 4.20 | 0.00 | 1.11 | 9.5 | <5 | 226.8 | <10 | 28.7 | 10.2 | 32.2 | <0.1 | 32.1 | 17571 | 4.27 | 0.03 | 3.8 | <0.01 | 279.78 | 14.49 |
| Trial Pit/Borehole No. | 12 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 6.30 | 1.15 | 13.59 | 19.0 | 3314 | 236.2 | 219.0 | 40.0 | 16.4 | 422.8 | 1.97 | 554.6 | 33696 | 33.03 | <0.02 | 564.6 | 10.69 | 1752.52 | 24.87 |
| D2 | | 5.85 | 0.89 | 4.74 | 9.8 | 16.6 | 71.6 | 93.6 | 52.9 | 19.1 | 148.5 | 1.41 | 276.9 | 34557 | 21.52 | 1.55 | 1114.3 | <0.01 | 1989.22 | 19.32 |
| D3 | | 3.00 | 0.00 | 1.11 | 19.4 | <5 | <0.5 | 35.1 | 32.1 | 14.8 | 46.5 | 0.61 | 28.6 | 19543 | 5.00 | 0.22 | 14.9 | <0.01 | 483.79 | 15.39 |
| Trial Pit/Borehole No. | 13 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 4.40 | 0.00 | 1.35 | 8.6 | <5 | <0.5 | <10 | 39.7 | 12.2 | 36.4 | 0.29 | 22.9 | 22452 | 0.63 | 0.10 | 3.3 | <0.01 | 26.76 | 12.842 |
| D2 | | 3.90 | 0.82 | 1.15 | 12.2 | <5 | <0.5 | <10 | 27.3 | 10.5 | 36.0 | 1.41 | <20 | 18090 | 1.14 | 0.05 | 1.1 | <0.01 | 42.47 | 11.066 |
| D3 | | 4.70 | 0.00 | 0.86 | 15.1 | <5 | <0.5 | <10 | 25.0 | 12.6 | 27.4 | 0.91 | <20 | 9549 | 0.61 | 0.04 | <1 | <0.01 | 53.37 | 9.098 |
| Trial Pit/Borehole No. | 14 | | | | | | | | | | | | | | | | | | | |
| Depth D1 | | 5.45 | 0.47 | 1.19 | 10.6 | <5 | <0.5 | <10 | 32.0 | 12.6 | 42.5 | 0.91 | 23.7 | 21218 | 1.87 | 0.06 | <1 | <0.01 | 56.88 | 5.306 |
| D2 | | 5.65 | 1.91 | 0.86 | 13.6 | <5 | <0.5 | <10 | 50.8 | 18.3 | 32.6 | 0.78 | <20 | 29045 | 1.8 | 0.13 | 1.2 | <0.01 | 79.65 | 10.635 |
| D3 | | 6.00 | 0.00 | 1.19 | 13.6 | <5 | <0.5 | <10 | 48.2 | 33.9 | 50.4 | 0.41 | <20 | 47461 | 3.13 | 0.04 | 2.3 | 0.10 | 36.12 | 10.91 |

HARRISON & COMPANY

## SITE : SEVENOAKS

Results relate to air dried whole soil and are expressed in mg/kg. unless otherwise stated

| | | pH | Stone Content % | Loss on Ignition % | Soil Moisture Content % | PAH | Phenols | Copper | Nickel | Chromium | Zinc | Cadmium | Lead | Iron | Arsenic | Mercury | Total Cyanide | Elemental Sulphur % | Water Soluble Sulphate | Water Soluble Chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trial Pit/Borehole No. | 15 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 5.90 | 0.00 | 1.31 | 11.2 | <5 | <0.5 | <10 | 13.6 | 10.5 | 36.5 | 1.11 | <20 | 18847 | 0.67 | 0.02 | 5.6 | <0.01 | 51.13 | 11.136 |
| | D2 | 3.85 | 0.24 | 0.56 | 8.0 | <5 | <0.5 | <10 | 48.6 | 19.2 | 33.2 | 0.51 | 24.0 | 31968 | 1.56 | 0.04 | 2.2 | <0.01 | 306.65 | 16.298 |
| | D3 | 4.00 | 0.00 | 43.22 | 14.6 | <5 | <0.5 | <10 | 78.7 | 36.3 | 48.8 | 1.16 | 27.3 | 61880 | 2.17 | 0.03 | 2.3 | <0.01 | 13.26 | 11.166 |
| Trial Pit/Borehole No. | 16 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 6.95 | 2.71 | 1.13 | 10.5 | <5 | <0.5 | <10 | 36.5 | 12.6 | 33.2 | 1.11 | 37.9 | 21164 | 3.23 | 0.07 | 6.5 | <0.01 | 12.13 | 5.697 |
| | D2 | 5.90 | 0.00 | 1.13 | 13.9 | <5 | <0.5 | <10 | 30.6 | 14.1 | 28.6 | 0.87 | 36.3 | 24413 | 4.08 | 0.03 | 2.9 | <0.01 | 36.07 | 6.992 |
| | D3 | 5.20 | 0.00 | 1.19 | 18.0 | <5 | <0.5 | <10 | 47.3 | 18.7 | 29.9 | 0.80 | 28.1 | 18662 | 24.26 | 0.03 | <1 | <0.01 | 53.53 | 9.165 |
| Trial Pit/Borehole No. | 17 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 5.45 | 1.01 | 5.523 | 15.9 | <5 | <0.5 | 30.8 | <10 | 12.2 | 55.9 | 1.46 | 274.96 | 25122 | 2.88 | 0.29 | 107.84 | 0.54 | 2056.353 | 22.53 |
| | D2 | 6.75 | 0 | 0.57 | 9.4 | <5 | <0.5 | <10 | 34.4 | 18.6 | 27.1 | 0.51 | <20 | 13451 | 0.6 | 0.04 | <1 | <0.01 | 210.734 | 9.28 |
| | D3 | 6.00 | 0 | 0.83 | 14.3 | <5 | <0.5 | 15.6 | 40.9 | 25.2 | 39.8 | 1.01 | <20 | 40458 | 2.27 | 0.06 | <1 | <0.01 | 192.55 | 15.048 |
| Trial Pit/Borehole No. | 18 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 4.40 | 0.55 | 11.52 | 11.2 | 33.9 | <0.5 | 79.4 | 41.1 | 14.7 | 83.9 | 1.21 | 678.2 | 40132 | 18.99 | 2.93 | 1035.0 | 8.50 | 349.75 | 21.228 |
| | D2 | 5.60 | 0.00 | 1.03 | 12.3 | <5 | <0.5 | <10 | 74.2 | 34.2 | 39.2 | 0.62 | 24.1 | 21535 | 6.83 | 0.02 | 7.6 | <0.01 | 14.00 | 6.464 |
| | D3 | 6.20 | 0.00 | 0.96 | 10.3 | <5 | <0.5 | <10 | 67.8 | 24.4 | 52.7 | 0.49 | 50.4 | 42463 | 14.82 | 0.04 | 2.2 | <0.01 | 22.14 | 9.426 |
| Trial Pit/Borehole No. | 19 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 4.90 | 1.67 | 0.99 | 4.6 | <5 | <0.5 | <10 | 84.6 | 42.1 | 33.5 | 0.67 | 49.6 | 25195 | 1.73 | 0.07 | 16.5 | <0.01 | 149.99 | 77.483 |
| | D2 | 5.55 | 0.00 | 1.07 | 5.0 | <5 | <0.5 | <10 | 52.8 | 16.9 | 39.8 | 0.51 | 38.2 | 34771 | 7.29 | 0.09 | 1.1 | <0.01 | 534.73 | 59.935 |
| | D3 | 6.10 | 0.00 | 0.41 | 5.5 | <5 | <0.5 | <10 | 30.5 | 13.0 | 24.7 | 1.14 | 24.3 | 26157 | 1.01 | 0.05 | 9.5 | <0.01 | 282.70 | 37.348 |
| Trial Pit/Borehole No. | 20 | | | | | | | | | | | | | | | | | | | |
| Depth | D1 | 6.10 | 0.00 | 1.16 | 4.3 | <5 | <0.5 | <10 | 34.8 | 12.8 | 37.2 | 0.72 | 48.2 | 21535 | 1.85 | 0.04 | 2.8 | <0.01 | 30.34 | 10.686 |
| | D2 | 5.50 | 0.00 | 0.64 | 4.5 | <5 | <0.5 | <10 | 39.4 | 19.3 | 29.9 | 0.62 | 24.1 | 27688 | 0.62 | 0.29 | <1 | <0.01 | 16.76 | 22.044 |
| | D3 | 5.50 | 0.00 | 0.35 | 2.1 | <5 | <0.5 | 15.6 | 45.9 | 12.7 | 13.4 | 1.22 | 28.6 | 17005 | 1.9 | 0.06 | <1 | <0.01 | 29.16 | 29.558 |




Otford Road, Sevenoaks, Kent.

Drawing No. C1935/22/7

**Trial Pit Location Plan**

Scale : Not to Scale

November 1992

# Appendix B
# Trial Pit and Borehole Logs, Site Photographs and Site Log

**WS Atkins Consultants Ltd.**
Woodcote Grove, Ashley Road
Epsom, Surrey, KT18 5BW
Tel: 01372 726140 Fax: 01372 740055

WS Atkins

# TRIAL PIT LOG

| | | | |
|---|---|---|---|
| Client : **Lattice Properties** | Job No : **A71430** | Trial Pit No : **TP19** | |
| Project : **Site Investigation** | Easting : **552800.56** | Sheet 1 of 1 | |
| Site : **Sevenoaks** | Northing : **157174.58** | Date commenced : | Date completed : |
| Excavated By : **JCB excavator** | Ground Level (mAOD) : **70.85** | **22/08/2000** | **22/08/2000** |

| Sample Location | Groundwater Strike | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|
| | | 0.10 | 70.75 | | TOPSOIL with sparse vegetation. |
| 1.0 | | | | | Loose dark brown medium to coarse silty SAND with occassional rootlets and some subangular coarse gravel. MADE GROUND. Black staining on western side of pit at 0.8m depth. |
| 2.0 | | 2.00 | 68.85 | | Soft light brown brown/orange sandy CLAY with some localised areas of grey staining and hydrocarbon odour. NATURAL GROUND. Becoming more sandy at 3m depth. |
| 3.5 | | 3.50 | 67.35 | | End of Trial Pit at 3.70 m |

Sample Details

| Sample Reference | Type (Soil or Water) | Depth (mBGL) | Description |
|---|---|---|---|
| 1.0 | S | 1.00 | SAND |
| 2.0 | S | 2.00 | SAND |
| 3.5 | S | 3.50 | SAND |

Remarks : Subsurface brick wall, visible at ground level, on east side of pit with concrete base at 0.5m depth on east side of pit. Pit backfilled with arisings upon completion.

Logged By : **LFB**

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WS Atkins

# TRIAL PIT LOG

| | | | |
|---|---|---|---|
| Client : **Lattice Properties** | Job No : **A71430** | Trial Pit No : **TP20** | |
| Project : **Site Investigation** | Easting : **552822.03** | Sheet 1 of 1 | |
| Site : **Sevenoaks** | Northing : **157148.21** | Date commenced : **23/08/2000** | Date completed : **23/08/2000** |
| Excavated By : **JCB excavator** | Ground Level (mAOD) : **71.73** | | |

| Sample Location | Groundwater Strike | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|
| | | 0.20 | 71.53 | | Loose brown sandy silty matrix with much organic matter. MADE GROUND. |
| TP20/01 | | 1.20 | 70.53 | | Loose orange medium to coarse sand with occasional gravels of brick and occasional clinker with some black staining. MADE GROUND. |
| TP20/02 | | 2.30 | 69.43 | | Loose orange medium to coarse SAND. NATURAL GROUND. |
| TP20/02 | | 4.00 | 67.73 | | Soft pale brown sandy CLAY. NATURAL GROUND. |
| | | | | | End of Trial Pit at 4.00 m |

Sample Details

| Sample Reference | Type (Soil or Water) | Depth (mBGL) | Description |
|---|---|---|---|
| TP20/01 | S | 1.00 | MADE GROUND |
| TP20/02 | S | 2.00 | MADE GROUND |
| TP20/02 | S | 3.00 | MADE GROUND |

Remarks :

Logged By : **MW**

**WS Atkins Environment**
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WS Atkins

# BOREHOLE LOG

| | | | |
|---|---|---|---|
| Boring Contractor : **ESL** | | Job No :**A71430** | Borehole No : **BH6** |
| Boring method : **RC** | | Client : **Lattice Properties** | Sheet 1 of 2 |
| Boring diameter : **186** | Casing diameter : **186** | Site : **Sevenoaks** | Ground level : **71.00** (Relative to Ordnance datum) |
| Boring equipment : **RST Auger Rig** | | Project : **Site Investigation** | Date commenced : **22/08/2000** / Date completed : **22/08/2000** |
| Easting : **552808.07** | Northing : **15717.09** | | |

| Sample Details | | | Groundwater Details | | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|---|---|---|
| Reference | Type (Soil/Water) | Depth (mBGL) | Strike | Well | | 71.00 | | |
| 01 | S | 1.00 | | | | | | Medium dense brown, slightly clayey fine to medium SAND with occasional GRAVEL of builder's rubble. MADE GROUND. |
| 02 | S | 2.00 | | | | | | Very clayey at 1.8m depth |
| | | | | | 2.60 | 68.40 | | |
| 03 | S | 3.00 | | | | | | Soft to firm light brown to brown sandy CLAY. NATURAL GROUND. |
| | | | | | 3.60 | 67.40 | | |
| | | | | | | | | Medium dense light brown clayey SAND. NATURAL GROUND. |
| | | | | | 4.80 | 66.20 | | |
| 04 | S | 5.00 | | | | | | Medium dense light brown/brown green fine to medium SAND. NATURAL GROUND. Unidentifed metal obstruction at 4.8m depth. |
| 05 | S | 7.00 | | | | | | Grey with hydrocarbon odour at 8.0m depth |
| | | | | | | | | Continued Next Sheet |

| Groundwater | | Remarks : | Logged By : |
|---|---|---|---|
| Struck (m) | Flow Remarks : | | **ESL** |

**WS Atkins Environment**
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WS Atkins

# BOREHOLE LOG

| | | | |
|---|---|---|---|
| Boring Contractor : **ESL** | | Job No :**A71430** | Borehole No : **BH6** |
| Boring method : **RC** | | Client : **Lattice Properties** | Sheet 2 of 2 |
| Boring diameter : **186** | Casing diameter : **186** | Site : **Sevenoaks** | Ground level : **71.00** (Relative to Ordnance datum) |
| Boring equipment : **RST Auger Rig** | | Project : **Site Investigation** | Date commenced : **22/08/2000** / Date completed : **22/08/2000** |
| Easting : **552808.07** | Northing : **15717.09** | | |

| Sample Details | | | Groundwater Details | | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|---|---|---|
| Reference | Type (Soil/Water) | Depth (mBGL) | Strike | Well | | **71.00** | | |
| 06 | S | 9.00 | | | | | | Medium dense light brown/brown green fine to medium SAND. NATURAL GROUND. |
| | | | | | | | | Brown/green at 9.2m depth |
| 07 | S | 10.00 | | | 10.00 | 61.00 | | |
| | | | | | | | | End of Borehole at 10.00 m |

| Groundwater | | Remarks : | Logged By : |
|---|---|---|---|
| Struck (m): | Flow Remarks : | | **ESL** |

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# WINDOW SAMPLE LOG

| | | | |
|---|---|---|---|
| Boring Contractor : **ESL** | | Job No :**A71430** | WS No : **WS1** |
| Boring method : **WS** | | Client : **Lattice Properties** | Sheet 1 of 1 |
| Boring diameter : **50** | Casing diameter : **50** | Site : **Sevenoaks** | Ground level : **69.43** (Relative to Ordnance datum) |
| Boring equipment : **Pneumatic hammer window sampler** | | Project : **Site Investigation** | Date commenced : **25/08/2000** / Date completed : **25/08/2000** |
| Easting : **552855.94** | Northing : **157194.73** | | |

| Sample Details | | | Groundwater Details | | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|---|---|---|
| Reference | Type (Soil/Water) | Depth (mBGL) | Strike | Well | | **69.43** | | |
| | | | | | 0.05 | 69.38 | | Medium flinty GRAVEL. MADE GROUND. |
| | | | | | | | | Dense brown silty SAND. NATURAL GROUND. |
| 01 | S | 1.00 | | | | | | |
| 02 | S | 2.00 | | | | | | Orange brown with some clay at 2.0m depth |
| | | | | | | | | Green at 2.8m depth |
| | | | | | | | | Brown at 3.5m depth |
| 03 | S | 4.00 | | | 4.00 | 65.43 | | End of Borehole at 4.00 m |

| Groundwater | | Remarks : | Logged By : |
|---|---|---|---|
| Struck (m): | Flow Remarks : | Hole backfilled with arisings upon completion. | **ESL** |

**WS Atkins Environment**
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# WINDOW SAMPLE LOG

| | | | |
|---|---|---|---|
| Boring Contractor : **ESL** | | Job No :**A71430** | WS No : **WS2** |
| Boring method : **WS** | | Client : **Lattice Properties** | Sheet 1 of 1 |
| Boring diameter : **50** | Casing diameter : **50** | Site : **Sevenoaks** | Ground level : **71.47** (Relative to Ordnance datum) |
| Boring equipment : **Pnumatic hammer window sampler** | | Project : **Site Investigation** | Date commenced : **25/08/2000** / Date completed : **25/08/2000** |
| Easting : **552886.25** | Northing : **157147.52** | | |

| Sample Details | | | Groundwater Details | | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|---|---|---|
| Reference | Type (Soil/Water) | Depth (mBGL) | Strike | Well | | **71.47** | | |
| | | | | | | | | Dense brown silty SAND with occasional hydrocarbon staining. NATURAL GROUND. |
| 01 | S | 1.00 | | | 1.00 | 70.47 | | |
| | | | | | | | | Stiff brown sandy CLAY. NATURAL GROUND. |
| 02 | S | 2.00 | | | 2.00 | 69.47 | | |
| | | | | | | | | Dark brown slightly silty SAND. NATURAL GROUND. |
| | | | | | | | | With fine green/brown gravels at 2.4m depth. |
| 03 | S | 3.00 | | | 3.00 | 68.47 | | Brown and slightly clayey with no gravels at 2.9m to 3.0m depth. |
| | | | | | | | | Orange brown SAND. NATURAL GROUND. |
| 04 | S | 4.00 | | | 4.00 | 67.47 | | |
| | | | | | | | | End of Borehole at 5.00 m |

| Groundwater | | Remarks : | Logged By : |
|---|---|---|---|
| Struck (m) | Flow Remarks : | Hole backfilled with arisings upon completion. | **ESL** |

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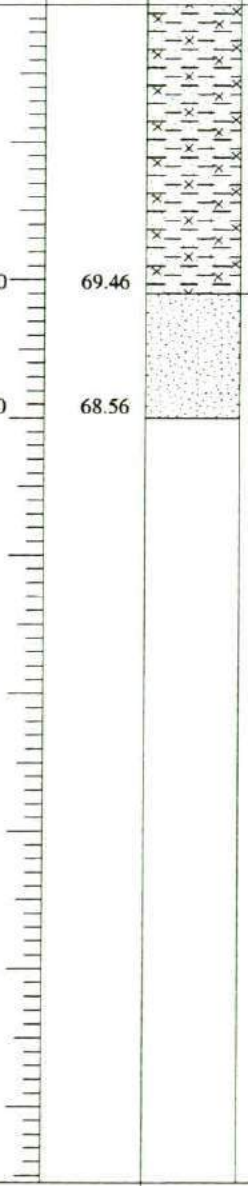
# WINDOW SAMPLE LOG

| | | | |
|---|---|---|---|
| Boring Contractor : ESL | | Job No :**A71430** | WS No : **WS3** |
| Boring method : **WS** | | Client : **Lattice Properties** | Sheet 1 of 1 |
| Boring diameter : **50** | Casing diameter : **50** | Site : **Sevenoaks** | Ground level : **71.56** (Relative to Ordnance datum) |
| Boring equipment : **Pnumatic hammer window sampler** | | Project : **Site Investigation** | Date commenced : **25/08/2000** / Date completed : **25/08/2000** |
| Easting : **552900.84** | Northing : **157146.69** | | |

| Sample Details | | | Groundwater Details | | Depth (mBGL) | Level (mAOD) | Key | Description of Strata |
|---|---|---|---|---|---|---|---|---|
| Reference | Type (Soil/Water) | Depth (mBGL) | Strike | Well | | **71.56** | | |
| 01 | S | 1.00 | | | | | | Stiff brown very sandy silty CLAY. NATURAL GROUND. Hydrocarbon staining at 0.4m to 0.7m depth |
| 02 | S | 2.00 | | | 2.10 | 69.46 | | Dark green brown clayey SAND. NATURAL GROUND. Dark brown at 2.1m depth. |
| 03 | S | 3.00 | | | 3.00 | 68.56 | | Slightly clayey at 2.8m depth<br>End of Borehole at 3.00 m |



| Groundwater | | Remarks : | Logged By : |
|---|---|---|---|
| Struck (m) | Flow Remarks : | Hole backfilled with arisings upon completion. | **ESL** |

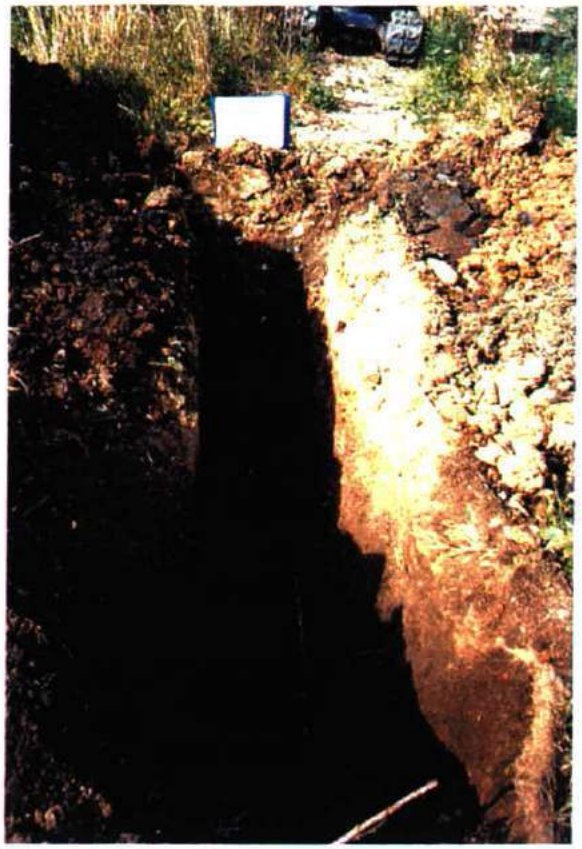


**Plate 1 – Excavation of TP19**

**Plate 2 – Excavation of TP20**

**Plate 3 – Spoil from TP20**

**Plate 4 – Eastern Transco Area**

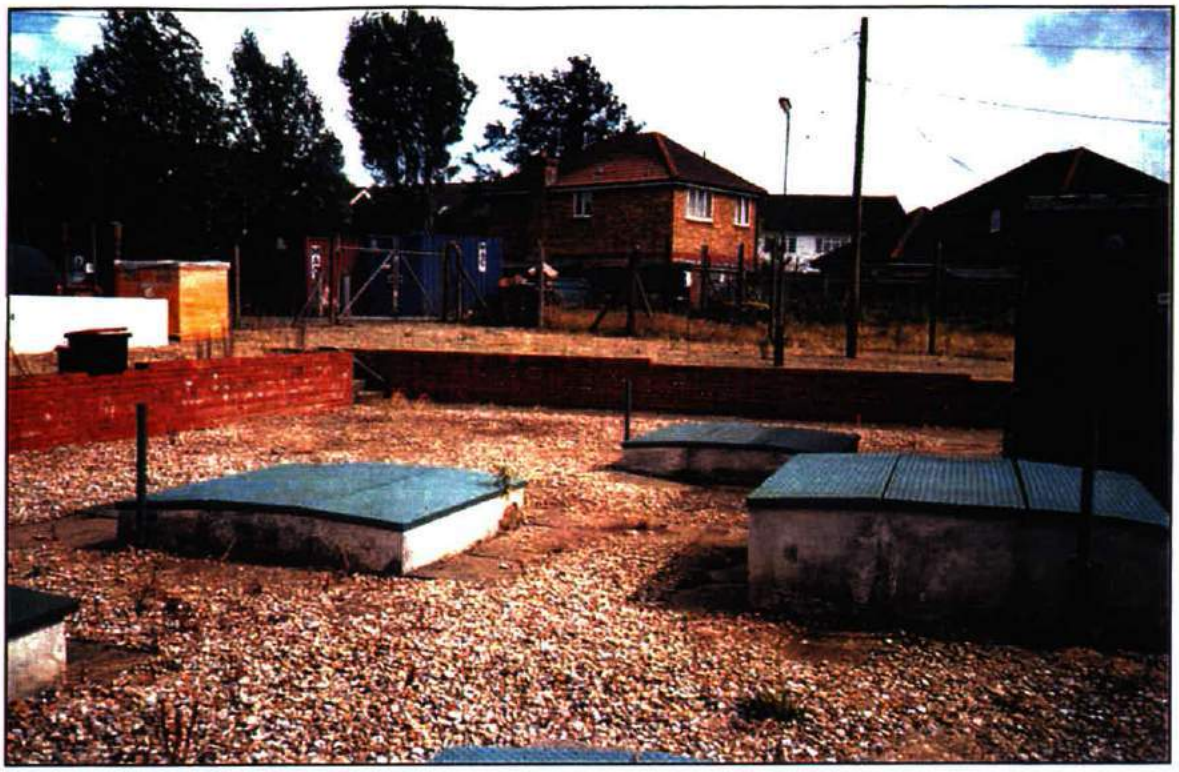


**Plate 5 – Eastern Transco Area**

# Sevenoaks Site Log (21 to 25 August 2000)

| Date | Plant and Labour | Progress | Notes |
|---|---|---|---|
| 21 August | M Watts, SubScan Engineer, one JCB driver | Identification of underground services, breakout of borehole locations, Construction of TPs19 and TP20. First set of samples sent to Lab. | Services marked on the ground and recorded on site sketch |
| 24 August | M Watts and one RST rig with two crew. | Construction of BH6. BHs 6 developed. | - |
| 25 August | M Watts and one window sampler with two crew. | Construction of WS1, WS2, WS3 and WS4. BH 6 sampled. Second set of samples sent to Lab. | Site levelled and tidied up. |

# Appendix C
# Results of Chemical Analysis

| Site Name: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date: | | | | | | | |
| Laboratory: | | | | | | | |
| Date Sampled | 25/08/00 | 25/08/00 | 25/08/00 | 25/08/00 | 25/08/00 | 24/08/00 | 24/08/00 |
| Laboratory Sample Ref. | 212 to 214 | 230 to 232 | 218 to 220 | 227 to 229 | 276 | 193 to 195 | 199 to 201 |
| Trial Pit/Borehole No. | BH 6 | BH 6 | BH 6 | BH 6 | CRM6138 | TP 19 | TP 19 |
| Sampling Depth (m) | 1 | 10 | 3 | 9 | | 1 | 3.5 |
| ========== | = | = | = | = | = | = | = |
| pH | 5.02 | 4.79 | 4.71 | 4.83 | N/A | 5.13 | 4.58 |
| % Loss on Ignition | 3 | 1 | 1 | <0.1 | N/A | 4.9 | 2 |
| % Moisture | 17.1 | 18.8 | 16.7 | 16.1 | N/A | 14.2 | 17 |
| % Stones | <0.1 | <0.1 | <0.1 | <0.1 | N/A | <0.1 | <0.1 |
| Cresols | <0.01 | 0.02 | <0.01 | <0.01 | N/A | 0.01 | <0.01 |
| Xylenols & Ethylphenols | <0.01 | <0.01 | <0.01 | <0.01 | N/A | <0.01 | <0.01 |
| Naphthols | <0.01 | <0.01 | <0.01 | <0.01 | N/A | <0.01 | <0.01 |
| Phenol | 0.06 | <0.01 | <0.01 | <0.01 | N/A | 0.01 | <0.01 |
| Trimethylphenol | <0.01 | <0.01 | <0.01 | <0.01 | N/A | <0.01 | <0.01 |
| Total Phenols | 0.06 | 0.02 | <0.01 | 0.01 | N/A | 0.02 | <0.01 |
| | | | | | | | |
| Napthalene | 2.86 | 4.05 | 3.69 | 5.53 | 0.28 | 30.61 | 10.23 |
| Acenaphthylene | 0.3 | 1.52 | 0.08 | 0.13 | 0.02 | 2.26 | 0.21 |
| Acenaphthene | 0.16 | 0.25 | 0.06 | 0.07 | 0.02 | 4.79 | 2.76 |
| Fluorene | 0.54 | 7.02 | 0.27 | 0.28 | 0.02 | 3.57 | 2.27 |
| Phenanthrene | 3.39 | 27.61 | 0.39 | 0.54 | 0.02 | 16.63 | 1.98 |
| Anthracene | 0.56 | 2.2 | 0.1 | 0.11 | 0.01 | 3.02 | 0.22 |
| Fluoranthene | 5.46 | 8.63 | 0.32 | 0.36 | 0.02 | 27.27 | 1.45 |
| Pyrene | 4.07 | 8.17 | 0.24 | 0.31 | 0.02 | 21.21 | 1.13 |
| Cyclopenta(cd)pyrene | 3.61 | 4.81 | 0.61 | 0.76 | 0.21 | 20.87 | 1.16 |
| Benzo(a)anthracene | 2.14 | 3.46 | 0.11 | 0.14 | 0.04 | 15.31 | 0.63 |
| Chrysene | 2.48 | 4.01 | 0.13 | 0.22 | 0.09 | 11.84 | 0.64 |
| Benzo(b)fluoranthene | 2.58 | 1.94 | 0.12 | 0.16 | 0.05 | 25.31 | 1.02 |
| Benzo(k)fluoranthene | 1.57 | 1.37 | 0.11 | 0.15 | 0.04 | 9.65 | 0.62 |
| Benzo(e)pyrene | 1.59 | 1.17 | 0.11 | 0.11 | 0.04 | 15.07 | 0.61 |
| Benzo(a)pyrene | 1.57 | 0.65 | 0.1 | 0.12 | 0.04 | 4.47 | 0.22 |
| Indeno(1/2/3-cd)pyrene | 1.6 | 0.91 | 0.14 | 0.12 | 0.02 | 27.84 | 1.02 |
| Di-benz(a/h)anthracene | 0.3 | 0.21 | 0.02 | 0.01 | <0.01 | 3.35 | 0.11 |
| Benzo(g/h/l)perylene | 2.02 | 1 | 0.1 | 0.09 | 0.03 | 28.16 | 0.46 |
| Anthanthrene | 0.24 | <0.01 | 0.02 | 0.02 | 0.01 | <0.01 | <0.01 |
| Total PAH | 37.04 | 78.98 | 6.7 | 9.22 | 0.98 | 271.22 | 26.74 |
| | | | | | | | |
| Easily-liberatable Cyanide | <1 | <1 | <1 | <1 | 4 | <1 | <1 |
| Complex Cyanide | 31.7 | 8.3 | 4.5 | <2.5 | 271 | 597.4 | 102 |
| Total Cyanide | 31.7 | 8.3 | 4.5 | <2.5 | 275 | 597.4 | 102 |
| Elemental Sulphur | <50 | <50 | <50 | 82 | <50 | <50 | 280 |
| Water Soluble Sulphate | 415 | 345 | 570 | 165 | 7925 | 850 | 565 |
| Water Soluble Chloride | 20 | 23 | 25 | 25 | 95 | 50 | 17 |
| Exchangeable Ammonium | 13.3 | 8.7 | 8.5 | 13 | N/A | 7.5 | 14.7 |
| Arsenic | 15 | 4 | 4 | 2 | 30 | 40 | 7 |
| Cadmium | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Chromium | 30 | 42 | 28 | 32 | 83 | 52 | 33 |
| Lead | 119 | <1 | <1 | <1 | 494 | 201 | 8 |
| Mercury | <1 | <1 | <1 | <1 | <1 | <1 | <1 |

| Site Name: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date: | | | | | | | |
| Laboratory: | | | | | | | |
| Date Sampled | 25/08/00 | 25/08/00 | 25/08/00 | 25/08/00 | 25/08/00 | 24/08/00 | 24/08/00 |
| Laboratory Sample Ref. | 212 to 214 | 230 to 232 | 218 to 220 | 227 to 229 | 276 | 193 to 195 | 199 to 201 |
| Trial Pit/Borehole No. | BH 6 | BH 6 | BH 6 | BH 6 | CRM6138 | TP 19 | TP 19 |
| Sampling Depth (m) | 1 | 10 | 3 | 9 | | 1 | 3.5 |
| ========== | = | = | = | = | = | = | = |
| Selenium | <1 | 1 | <1 | <1 | 2 | <1 | <1 |
| Copper | 9 | 5 | 5 | 3 | 107 | 35 | 13 |
| Nickel | 8 | 7 | 3 | 9 | <1 | 4 | 1 |
| Zinc | 63 | 26 | 20 | 14 | 405 | 30 | 22 |
| Boron | <1 | <1 | <1 | <1 | N/A | <1 | <1 |
| | | | | | | | |
| Benzene | <0.001 | <0.001 | <0.001 | <0.001 | N/A | <0.001 | <0.001 |
| Toluene | <0.001 | <0.001 | <0.001 | 0.154 | N/A | <0.001 | <0.001 |
| Ethylbenzene | <0.001 | 0.036 | <0.001 | 1.784 | N/A | <0.001 | <0.001 |
| Xylene | <0.001 | 0.137 | <0.001 | 6.254 | N/A | <0.001 | <0.001 |
| TPH | 7 | 80 | 2 | 1 | N/A | 1685 | 760 |
| ADDITIONAL ANALYTES | | | | | | | |
| Acid Soluble Sulphide | 4 | <1 | <1 | <1 | N/A | <1 | 8 |
| Thiocyanate | <1 | <1 | <1 | <1 | N/A | <1 | <1 |
| 2-Isopropyl Phenol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 | N/A | <0.01 | <0.01 |
| Catechol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 | N/A | <0.01 | <0.01 |
| Resorcinol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 | N/A | <0.01 | <0.01 |
| Tot. Org Carbon in Soil | N/A | N/A | N/A | 0.15 | N/A | 3.12 | N/A |
| Fraction Organic Carbon | N/A | N/A | N/A | N/A | N/A | 86.4 | N/A |
| Total Carbon | N/A | N/A | N/A | N/A | N/A | 3.61 | N/A |

N/A - Not Analysed

All concentrations expressed in mg/kg of air dried soil samples unless otheriwse indicated

| Site Name: | BG Sevenoaks | | | | | | |
|---|---|---|---|---|---|---|---|
| Date: | 23/08/00 | | | | | | |
| Laboratory: | ALcontrol Geochem Analytical Services | | | | | | |
| Date Sampled | 25/08/00 | 25/08/00 | 25/08/00 | 29/08/00 | 29/08/00 | 29/08/00 | 29/08/00 |
| Laboratory Sample Ref. | 254 to 256 | 262 to 264 | 257 to 258 | 277 to 279 | 283 to 285 | 286 to 288 | 289 to 291 |
| Trial Pit/Borehole No. | TP 20 | TP 20 | TP 20 DU | WS1 | WS1 | WS1 | WS2 |
| Sampling Depth (m) | 1 | 3 | 1 | 1 | 3 | 4 | 1 |
| ========== | = | = | = | = | = | = | = |
| pH | 4.33 | 4.08 | 4.25 | 6.01 | 7.38 | 7.09 | 4.83 |
| % Loss on Ignition | 1 | 3 | 1 | 2 | 2.9 | 3 | 2.9 |
| % Moisture | 13.3 | 14.1 | 11.1 | 16.2 | 12.6 | 12.9 | 13.9 |
| % Stones | <0.1 | <0.1 | <0.1 | 9.5 | 0.7 | 4 | 4.2 |
| Cresols | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Xylenols & Ethylphenols | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Naphthols | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Phenol | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Trimethylphenol | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Total Phenols | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| | | | | | | | |
| Napthalene | 0.83 | 0.89 | 0.17 | 0.9 | 1.62 | 0.46 | 0.26 |
| Acenaphthylene | 0.31 | 0.15 | 0.33 | 0.02 | 3.42 | 0.03 | 0.03 |
| Acenaphthene | 0.18 | 0.2 | 0.03 | 0.02 | 0.2 | 0.02 | <0.01 |
| Fluorene | 0.82 | 0.51 | 0.11 | 0.02 | 1.5 | 0.03 | 0.01 |
| Phenanthrene | 8.4 | 0.43 | 0.42 | 0.02 | 56.21 | 0.09 | 0.02 |
| Anthracene | 0.9 | 0.1 | 0.19 | 0.01 | 2.37 | 0.02 | 0.01 |
| Fluoranthene | 8.54 | 0.41 | 0.6 | 0.05 | 33.1 | 0.04 | 0.02 |
| Pyrene | 5.88 | 0.31 | 0.51 | 0.04 | 34.02 | 0.05 | 0.01 |
| Cyclopenta(cd)pyrene | 2.58 | 0.54 | 1.42 | 0.12 | 20.11 | 0.34 | 0.26 |
| Benzo(a)anthracene | 2.35 | 0.12 | 0.26 | 0.01 | 7.94 | 0.01 | 0.02 |
| Chrysene | 2.95 | 0.31 | 0.49 | 0.03 | 14.54 | 0.03 | 0.04 |
| Benzo(b)fluoranthene | 1.86 | 0.12 | 0.17 | 0.01 | 6.42 | 0.01 | 0.03 |
| Benzo(k)fluoranthene | 1.42 | 0.15 | 0.21 | 0.01 | 6.09 | 0.01 | 0.02 |
| Benzo(e)pyrene | 1.34 | 0.1 | 0.16 | 0.01 | 6.42 | 0.01 | 0.02 |
| Benzo(a)pyrene | 1.32 | 0.11 | 0.16 | 0.01 | 1.67 | 0.01 | 0.02 |
| Indeno(1/2/3-cd)pyrene | 1.35 | 0.08 | 0.13 | 0.01 | 5.51 | 0.01 | 0.01 |
| Di-benz(a/h)anthracene | 0.16 | 0.01 | 0.02 | <0.01 | 0.48 | <0.01 | <0.01 |
| Benzo(g/h/l)perylene | 0.88 | 0.08 | 0.1 | 0.01 | 4.83 | 0.01 | 0.01 |
| Anthanthrene | 0.16 | 0.02 | 0.01 | <0.01 | 1.42 | <0.01 | <0.01 |
| Total PAH | 42.24 | 4.62 | 5.48 | 1.32 | 207.81 | 1.16 | 0.8 |
| | | | | | | | |
| Easily-liberatable Cyanide | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Complex Cyanide | 5.5 | 3.4 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| Total Cyanide | 5.5 | 3.4 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| Elemental Sulphur | <50 | <50 | <50 | <50 | 1435 | <50 | <50 |
| Water Soluble Sulphate | 355 | 250 | 345 | <5 | 40 | 70 | 155 |
| Water Soluble Chloride | 29 | 27 | 19 | 23.5 | 40 | 55 | 16 |
| Exchangeable Ammonium | 7.4 | 5.2 | 5.1 | 5.4 | 0.7 | 16.9 | 15.9 |
| Arsenic | 4 | 7 | 5 | 7 | 5 | 10 | 9 |
| Cadmium | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Chromium | 64 | 29 | 56 | 36 | 32 | 70 | 45 |
| Lead | <1 | 2 | 1 | 6 | 5 | 3 | 3 |
| Mercury | <1 | <1 | <1 | <1 | <1 | <1 | <1 |

| Site Name: | BG Sevenoaks | | | | | | |
|---|---|---|---|---|---|---|---|
| Date: | 23/08/00 | | | | | | |
| Laboratory: | ALcontrol Geochem Analytical Services | | | | | | |
| Date Sampled | 25/08/00 | 25/08/00 | 25/08/00 | 29/08/00 | 29/08/00 | 29/08/00 | 29/08/00 |
| Laboratory Sample Ref. | 254 to 256 | 262 to 264 | 257 to 258 | 277 to 279 | 283 to 285 | 286 to 288 | 289 to 291 |
| Trial Pit/Borehole No. | TP 20 | TP 20 | TP 20 DU | WS1 | WS1 | WS1 | WS2 |
| Sampling Depth (m) | 1 | 3 | 1 | 1 | 3 | 4 | 1 |
| ========== | = | = | = | = | = | = | = |
| Selenium | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Copper | 3 | 7 | 7 | 8 | 8 | 6 | 17 |
| Nickel | 9 | 8 | 7 | 5 | 21 | 16 | 14 |
| Zinc | 29 | 44 | 26 | 21 | 22 | 21 | 36 |
| Boron | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| | | | | | | | |
| Benzene | <0.001 | <0.001 | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Toluene | <0.001 | <0.001 | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | <0.001 | <0.001 | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Xylene | <0.001 | <0.001 | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| TPH | 12 | 3 | 2 | 12 | 426 | 2 | 2 |
| ADDITIONAL ANALYTES | | | | | | | |
| Acid Soluble Sulphide | <1 | <1 | <1 | 12 | 18 | <1 | <1 |
| Thiocyanate | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 2-Isopropyl Phenol by HPLC | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Catechol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Resorcinol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Tot. Org Carbon in Soil | N/A | N/A | N/A | 0.16 | N/A | N/A | 0.09 |
| Fraction Organic Carbon | N/A | N/A | N/A | 50 | N/A | N/A | 52.9 |
| Total Carbon | N/A | N/A | N/A | 0.32 | N/A | N/A | 0.17 |

N/A - Not Analysed

All concentrations expressed

| Site Name: | BG Sevenoaks | | | |
|---|---|---|---|---|
| Date: | 23/08/00 | | | |
| Laboratory: | ALcontrol Geochem Analytical Services | | | |
| Date Sampled | 29/08/00 | 29/08/00 | 29/08/00 | 29/08/00 |
| Laboratory Sample Ref. | 295 to 297 | 298 to 299 | 301 to 303 | 307 to 309 |
| Trial Pit/Borehole No. | WS2 | WS2 | WS3 | WS3 |
| Sampling Depth (m) | 3 | 4 | 1 | 3 |
| ========== | = | = | = | = |
| pH | 4.36 | 4.67 | 5.3 | 6.88 |
| % Loss on Ignition | 3 | 2 | 4.1 | 3.1 |
| % Moisture | 11.7 | 11.5 | 16.6 | 13 |
| % Stones | 2.7 | 2.2 | 5.4 | <0.1 |
| Cresols | <0.01 | <0.01 | <0.01 | <0.01 |
| Xylenols & Ethylphenols | <0.01 | <0.01 | <0.01 | <0.01 |
| Naphthols | <0.01 | <0.01 | <0.01 | <0.01 |
| Phenol | <0.01 | 0.03 | <0.01 | <0.01 |
| Trimethylphenol | <0.01 | <0.01 | <0.01 | <0.01 |
| Total Phenols | <0 01 | 0.03 | <0.01 | <0.01 |
| | | | | |
| Napthalene | 0.84 | 0.43 | 1.86 | 1.13 |
| Acenaphthylene | 0.07 | 0.04 | 0.02 | 0.03 |
| Acenaphthene | 0.01 | 0.02 | 0.03 | 0.02 |
| Fluorene | 0.04 | 0.04 | 0.04 | 0.04 |
| Phenanthrene | 0.05 | 0.04 | 0.1 | 0.1 |
| Anthracene | 0.03 | 0.01 | 0.02 | 0.02 |
| Fluoranthene | 0.02 | 0.04 | 0.14 | 0.12 |
| Pyrene | 0.02 | 0.03 | 0.12 | 0.1 |
| Cyclopenta(cd)pyrene | 0.35 | 0.53 | 0.2 | 0.45 |
| Benzo(a)anthracene | 0.02 | 0.07 | 0.03 | 0.04 |
| Chrysene | 0.04 | 0.12 | 0.09 | 0.12 |
| Benzo(b)fluoranthene | 0.01 | 0.1 | 0.03 | 0.04 |
| Benzo(k)fluoranthene | 0.03 | 0.11 | 0.04 | 0.08 |
| Benzo(e)pyrene | 0.03 | 0.09 | 0.03 | 0.06 |
| Benzo(a)pyrene | 0.02 | 0.09 | 0.04 | 0.05 |
| Indeno(1/2/3-cd)pyrene | 0.01 | 0.11 | 0.02 | 0.04 |
| Di-benz(a/h)anthracene | <0.01 | 0.01 | <0.01 | 0.01 |
| Benzo(g/h/l)perylene | 0.01 | 0.09 | 0.02 | 0.06 |
| Anthanthrene | <0.01 | 0.02 | <0.01 | <0.01 |
| Total PAH | 1.6 | 1.98 | 2.82 | 2.51 |
| | | | | |
| Easily-liberatable Cyanide | <1 | <1 | <1 | <1 |
| Complex Cyanide | <2.5 | <2.5 | <2.5 | <2.5 |
| Total Cyanide | <2.5 | <2.5 | <2.5 | <2.5 |
| Elemental Sulphur | <50 | <50 | <50 | <50 |
| Water Soluble Sulphate | 70 | 95 | 110 | <5 |
| Water Soluble Chloride | 21.5 | 30 | 21.5 | 23.5 |
| Exchangeable Ammonium | 15.2 | 6.6 | 8.5 | 5.2 |
| Arsenic | 4 | 3 | 11 | 11 |
| Cadmium | <1 | <1 | <1 | <1 |
| Chromium | 44 | 43 | 55 | 40 |
| Lead | 4 | 6 | 22 | 9 |
| Mercury | <1 | <1 | <1 | <1 |

| Site Name: | BG Sevenoaks | | | |
|---|---|---|---|---|
| Date: | 23/08/00 | | | |
| Laboratory: | ALcontrol Geochem Analytical Services | | | |
| Date Sampled | 29/08/00 | 29/08/00 | 29/08/00 | 29/08/00 |
| Laboratory Sample Ref. | 295 to 297 | 298 to 299 | 301 to 303 | 307 to 309 |
| Trial Pit/Borehole No. | WS2 | WS2 | WS3 | WS3 |
| Sampling Depth (m) | 3 | 4 | 1 | 3 |
| ========== | = | = | = | = |
| Selenium | <1 | <1 | 14 | <1 |
| Copper | 11 | 1 | 17 | 8 |
| Nickel | 15 | 12 | 21 | 10 |
| Zinc | 23 | 20 | 53 | 21 |
| Boron | <1 | <1 | <1 | <1 |
| | | | | |
| Benzene | <0.001 | <0.001 | <0.001 | <0.001 |
| Toluene | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | <0.001 | <0.001 | <0.001 | <0.001 |
| Xylene | <0.001 | <0.001 | <0.001 | <0.001 |
| TPH | 9 | 20 | 3 | 3 |
| ADDITIONAL ANALYTES | | | | |
| Acid Soluble Sulphide | <1 | <1 | <1 | <1 |
| Thiocyanate | <1 | <1 | <1 | <1 |
| 2-Isopropyl Phenol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 |
| Catechol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 |
| Resorcinol by HPLC | <0.01 | <0.01 | <0.01 | <0.01 |
| Tot. Org Carbon in Soil | N/A | N/A | N/A | 0.04 |
| Fraction Organic Carbon | N/A | N/A | N/A | 19 |
| Total Carbon | N/A | N/A | N/A | 0.21 |

N/A - Not Analysed

All concentrations expressed

| Site Name: | BG Sevenoaks | | | |
|---|---|---|---|---|
| Date: | 23/08/00 | | | |
| Laboratory: | ALcontrol Geochem Analytical Services | | | |
| Date Sampled | 24/08/00 | 29/08/00 | | |
| Laboratory Sample Reference | 193 to 195 | 283 to 285 | | |
| Trial Pit/Borehole No. | TP 19 | WS1 | | |
| Sampling Depth (m) | 1 | 3 | | |
| ========== | = | = | | |
| pH | 6.85 | 7.29 | | |
| TOC | 9 | 8 | | |
| Conductivity (uS/cm) | 205 | 23 | | |
| | | | | |
| Cresols | <0.01 | <0.01 | | |
| Xylenols & Ethylphenols | <0.01 | <0.01 | | |
| Naphthols | <0.01 | 0.01 | | |
| Phenol | <0.01 | <0.01 | | |
| Trimethylphenol | <0.01 | <0.01 | | |
| Total Phenols | <0.01 | 0.01 | | |
| | | | | |
| Naphthalene | 0.00006 | 0.00047 | | |
| Acenaphthylene | 0.00005 | 0.00006 | | |
| Acenaphthene | 0.00001 | 0.0002 | | |
| Fluorene | 0.00002 | 0.00014 | | |
| Phenanthrene | 0.00003 | 0.0004 | | |
| Anthracene | 0.00003 | 0.00013 | | |
| Fluoranthene | <0.00001 | <0.00001 | | |
| Pyrene | 0.0001 | 0.00021 | | |
| Benzo(a)anthracene | <0.00001 | 0.00003 | | |
| Chrysene | <0.00001 | 0.00002 | | |
| Benzo(b)fluoranthene | <0.00001 | <0.00001 | | |
| Benzo(k)fluoranthene | <0.00001 | <0.00001 | | |
| Benzo(a)pyrene | <0.00001 | <0.00001 | | |
| Indeno(1/2/3-cd)pyrene | <0.00001 | <0.00001 | | |
| Di-benz(a/h)anthracene | <0.00001 | <0.00001 | | |
| Benzo(g/h/i)perylene | <0.00001 | <0.00001 | | |
| Total PAH | 0.0003 | 0.00165 | | |
| | | | | |
| Easily-liberatable Cyanide | <0.5 | <0.5 | | |
| Total Cyanide | <0.5 | <0.5 | | |
| Sulphate | 144 | 9 | | |
| Total Ammonium | <0.2 | 0.6 | | |
| | | | | |
| Arsenic | <0.05 | 0.05 | | |
| Cadmium | <0.05 | <0.05 | | |
| Chromium | <0.05 | <0.05 | | |
| Lead | <0.05 | <0.05 | | |
| Mercury | <0.05 | <0.05 | | |
| Selenium | <0.1 | <0.1 | | |
| Copper | <0.05 | <0.05 | | |
| Nickel | <0.05 | <0.05 | | |
| Zinc | <0.05 | <0.05 | | |
| Iron | 1.04 | 0.79 | | |
| | | | | |
| ADDITIONAL ANALYTES | | | | |
| Thiocyanate on leachate | <0.2 | <0.2 | | |
| Sulphide on Leachate | 0.06 | 0.08 | | |
| Chloride Dionex Leachate | 2 | 5 | | |
| Nitrate Dionex Leachate | <0.01 | 0.06 | | |
| 2-Isopropyl Phenol Leach HPLC | <0.01 | <0.01 | | |
| Catechol Leachate HPLC | <0.01 | <0.01 | | |
| Resorcinol Leachate HPLC | <0.01 | <0.01 | | |
| Anthanthrene | <0.00001 | <0.00001 | | |
| Benzo(e)pyrene | <0.00001 | <0.00001 | | |
| Cyclopenta(cd)pyrene | <0.00001 | <0.00001 | | |
| N/A - Not Analysed | | | | |
| All results expressed as mg/l soil unless otherwise stated | | | | |

| Site Name: | BG Sevenoaks | | | |
|---|---|---|---|---|
| Date: | 23/08/00 | | | |
| Laboratory: | ALcontrol Geochem Analytical Services | | | |
| Date Sampled | 29/08/00 | | | |
| Laboratory Sample Ref. | 357 to 364 | | | |
| Trial Pit/Borehole No. | BH6 | | | |
| Sampling Depth (m) | | | | |
| | = | | | |
| pH | 5.47 | | | |
| TOC | 10 | | | |
| Suspended solids | 6935 | | | |
| Conductivity (uS/cm) | 1158 | | | |
| | | | | |
| Cresols | <0.01 | | | |
| Xylenols & Ethylphenols | <0.01 | | | |
| Naphthols | <0.01 | | | |
| Phenol | <0.01 | | | |
| Trimethylphenol | <0.01 | | | |
| Total Phenols | 0.02 | | | |
| | | | | |
| Napthalene | 1.46244 | | | |
| Acenaphthylene | 0.21272 | | | |
| Acenaphthene | 0.01421 | | | |
| Fluorene | 0.04432 | | | |
| Phenanthrene | 0.04072 | | | |
| Anthracene | 0.0105 | | | |
| Fluoranthene | 0.0029 | | | |
| Pyrene | 0.00374 | | | |
| Benzo(a)anthracene | 0.00016 | | | |
| Chrysene | 0.00023 | | | |
| Benzo(b)fluoranthene | 0.00002 | | | |
| Benzo(k)fluoranthene | 0.00002 | | | |
| Benzo(a)pyrene | 0.00003 | | | |
| Indeno(1/2/3-cd)pyrene | <0.00001 | | | |
| Di-benz(a/h)anthracene | <0.00001 | | | |
| Benzo(g/h/l)perylene | <0.00001 | | | |
| Total PAH | 1.79273 | | | |
| | | | | |
| Easily-liberatable Cyanide | <0.5 | | | |
| Total Cyanide | <0.5 | | | |
| Thiocyanate | <0.2 | | | |
| Sulphate | 514 | | | |
| Sulphide | 0.02 | | | |
| Chloride | 20 | | | |
| Total Ammonium | 27.1 | | | |
| | | | | |
| Arsenic | <0.05 | | | |
| Cadmium | <0.05 | | | |
| Chromium | <0.05 | | | |
| Lead | <0.05 | | | |
| Mercury | <0.05 | | | |
| Selenium | <0.1 | | | |
| Copper | <0.05 | | | |
| Nickel | 0.08 | | | |
| Zinc | 0.21 | | | |
| Iron | 12.12 | | | |
| | | | | |
| Benzene | <0.001 | | | |
| Toluene | 0.017 | | | |
| Ethylbenzene | 0.227 | | | |
| Xylene | 0.87 | | | |
| | | | | |
| TPH | 9.63 | | | |
| | | | | |
| ADDITIONAL ANALYTES | | | | |
| Nitrate | 23.9 | | | |
| 2-Isopropyl Phenol by HPLC | 0.01 | | | |
| Catechol by HPLC | <0.01 | | | |
| Resorcinol by HPLC | <0.01 | | | |
| Cyclopenta(cd)pyrene | 0.00071 | | | |
| Benzo(e)pyrene | 0.00002 | | | |
| Anthanthrene | <0.00001 | | | |

N/A - Not Analysed

All results are expressed as mg/l unless otherwise stated

# ALcontrol Geochem

## $C_{10}$ to $C_{40}$ Hydrocarbons

**Job Number : 00/05609/02/01**
**Client : W.S. Atkins**
**Ref : A71430**
**Sample Type : SOIL**
**Units : mg/kg**

| Sample No | Sample Identity | Depth | Total Soluble Extract | Diesel Range Hydrocarbons | Mineral Oil | Carbon Range Distribution | | | Interpretation |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $C_{10}$-$C_{20}$ | $C_{21}$-$C_{30}$ | $C_{31}$-$C_{40}$ | |
| | | | | | | | | | |
| 193 | TP 19 | 1 | | 1685 | | 505 | 842 | 337 | Naphthalene/Naphthas/Possible PAH's/Biodegraded Diesel |
| 199 | TP 19 | 3.5 | | 760 | | 380 | 228 | 152 | Naphthalene/Naphthas/Possible PAH's/Biodegraded Diesel |
| 212 | BH 6 | 1 | | 7 | | 3 | 3 | 1 | Possible Biodegraded Diesel/Possible PAH's |
| 218 | BH 6 | 3 | | 2 | | 1 | < 1 | < 1 | Possible Biodegraded Diesel/Possible PAH's |
| 227 | BH 6 | 9 | | 1 | | < 1 | < 1 | < 1 | Possible Biodegraded Diesel/Possible PAH's |
| 230 | BH 6 | 10 | | 80 | | 40 | 24 | 16 | Naphthalene/Naphthas/PAH's/Biodegraded Diesel |
| 254 | TP 20 | 1 | | 12 | | 6 | 4 | 2 | Biodegraded Diesel/Possible PAH's |
| 257 | TP 20 DUP | 1 | | 2 | | 1 | < 1 | < 1 | Biodegraded Diesel/Carboxylic Acids |
| 262 | TP 20 | 3 | | 3 | | 2 | < 1 | < 1 | Biodegraded Diesel/Carboxylic Acids |

# ALcontrol Geochem

## $C_{10}$ to $C_{40}$ Hydrocarbons

**Job Number : 00/05609/02/01**
**Client : W.S. Atkins**
**Ref : A71430**
**Sample Type : SOIL**
**Units : mg/kg**

| Sample No | Sample Identity | Depth | Total Soluble Extract | Diesel Range Hydrocarbons | Mineral Oil | Carbon Range Distribution | | | Interpretation |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $C_{10}$-$C_{20}$ | $C_{21}$-$C_{30}$ | $C_{31}$-$C_{40}$ | |
| 277 | WS1 | 1 | | 12 | | 6 | 4 | 2 | Possible Biodegraded Diesel |
| 283 | WS1 | 3 | | 426 | | 213 | 128 | 85 | Gasolene Residues/PAHs |
| 286 | WS1 | 4 | | 2 | | < 1 | < 1 | < 1 | No Identification Possible |
| 289 | WS2 | 1 | | 2 | | 1 | < 1 | < 1 | No Identification Possible |
| 295 | WS2 | 3 | | 9 | | 5 | 3 | 2 | Biodegraded Diesel |
| 298 | WS2 | 4 | | 20 | | 10 | 6 | 4 | Biodegraded Diesel |
| 301 | WS3 | 1 | | 3 | | 2 | 1 | < 1 | Biodegraded Diesel |
| 307 | WS3 | 3 | | 3 | | 2 | 1 | < 1 | Biodegraded Diesel |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

# Appendix D
# Groundwater Level

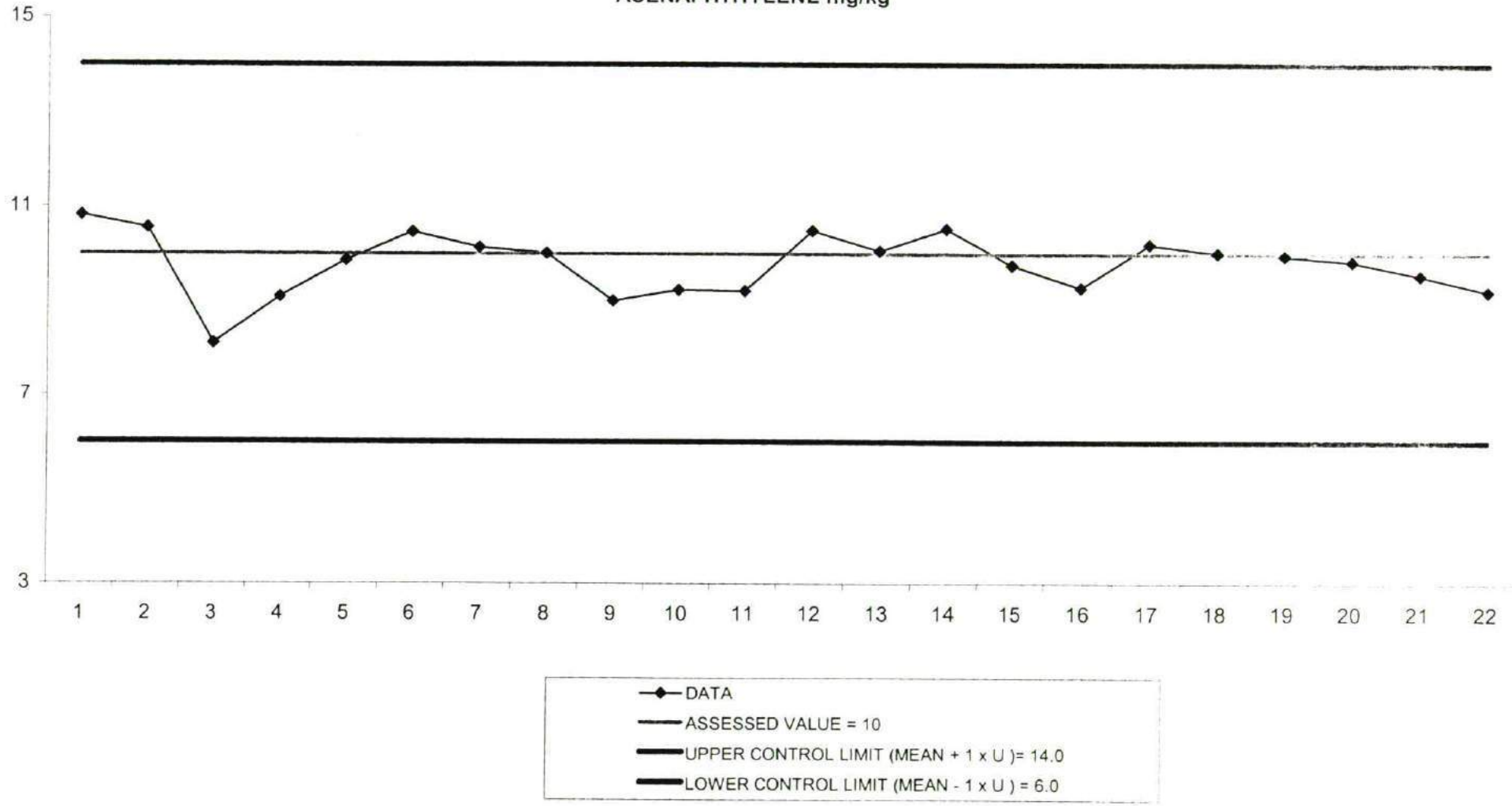
# Groundwater Level

| | Date: | 25th August 2000 | | 31st October 2000 | | Aquifer |
|---|---|---|---|---|---|---|
| **Borehole ID** | **Elevation (m AOD) to top of pipe** | **Depth to water** | **Water level (m AOD)** | **Depth to water** | **Water level (m AOD)** | |
| **BH6** | 71.29. | 5.4 | 65.89 | 5.25 | 66.04 | Folkestone Beds |

# Appendix E
# Analytical Laboratory Control Charts and Testing Standards

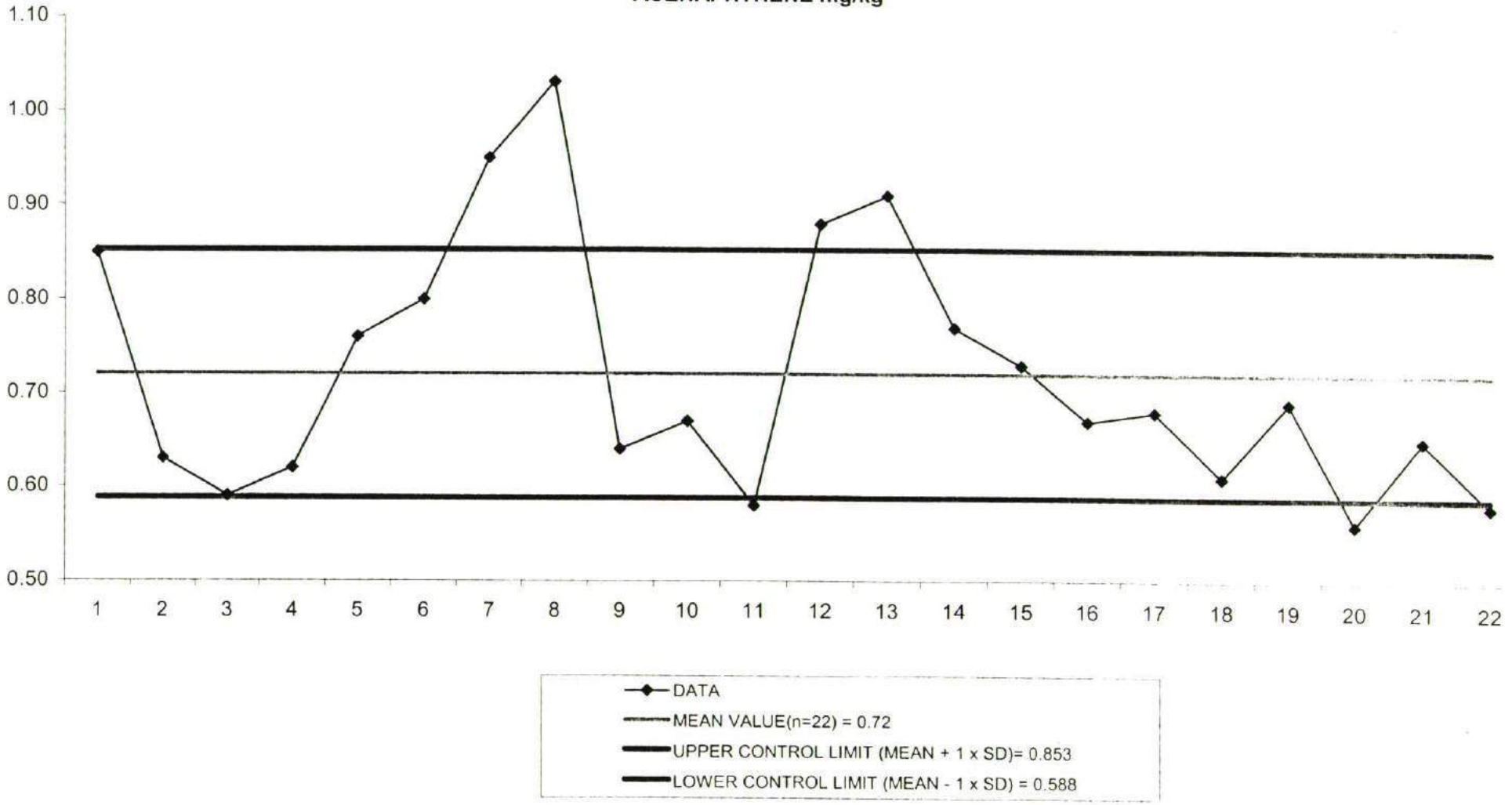
## CRM LGC 6140

### ACENAPHTHYLENE mg/kg



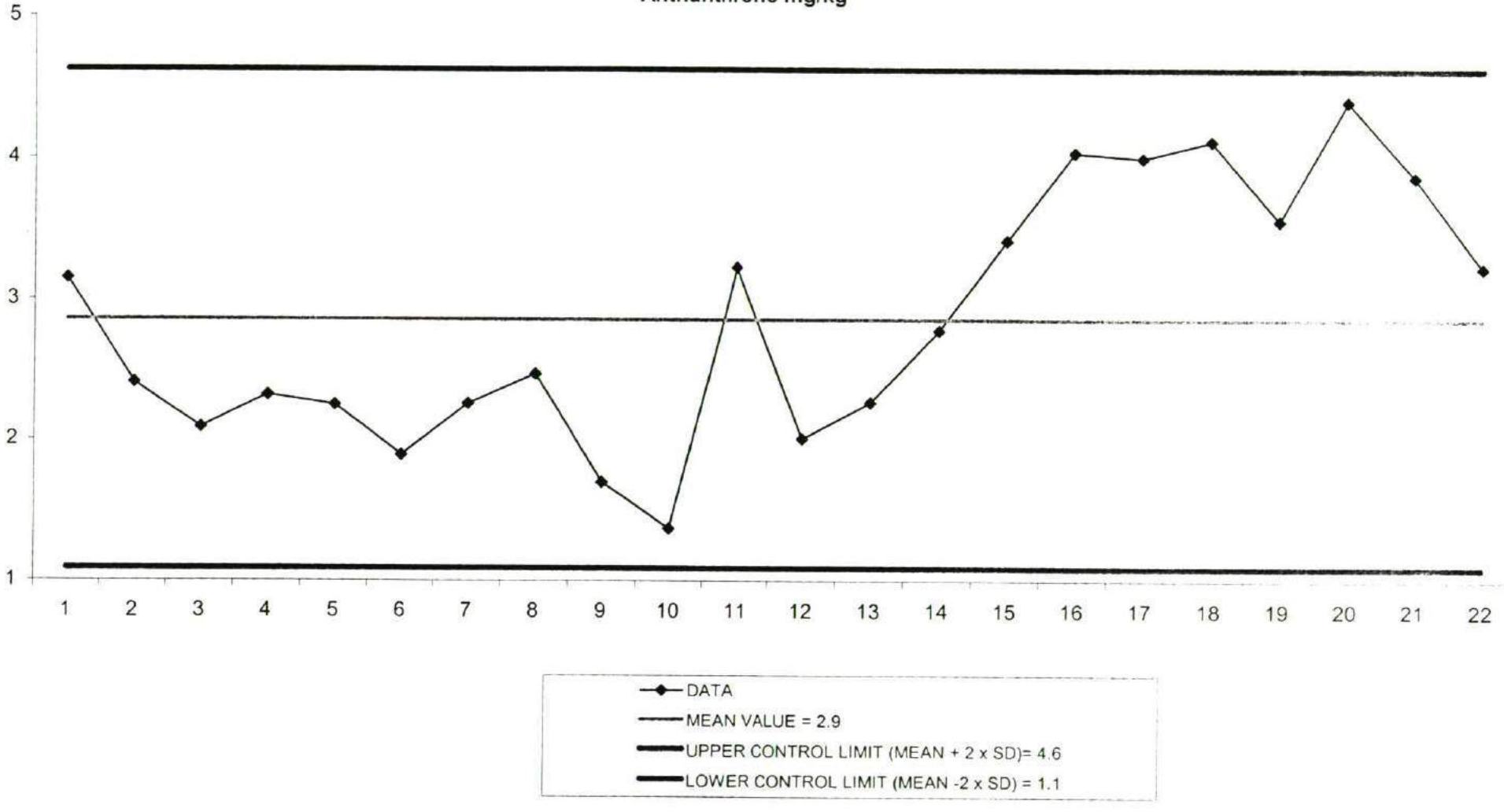
## CRM LGC 6140

**ACENAPHTHENE mg/kg**



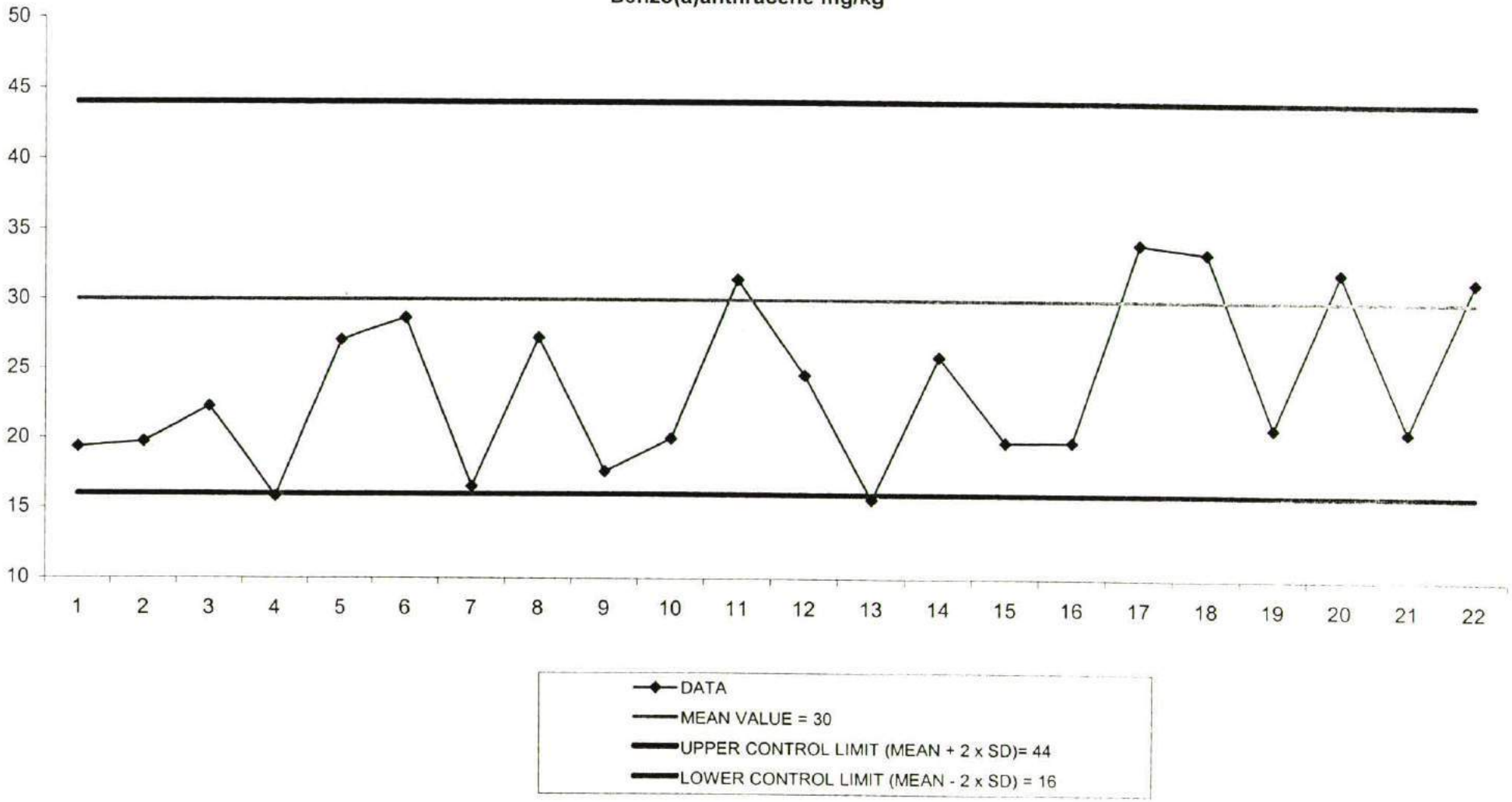
## CRM LGC 6140

**Anthanthrene mg/kg**



## CRM LGC 6140

**Benzo(a)anthracene mg/kg**



## CRM LGC 6140

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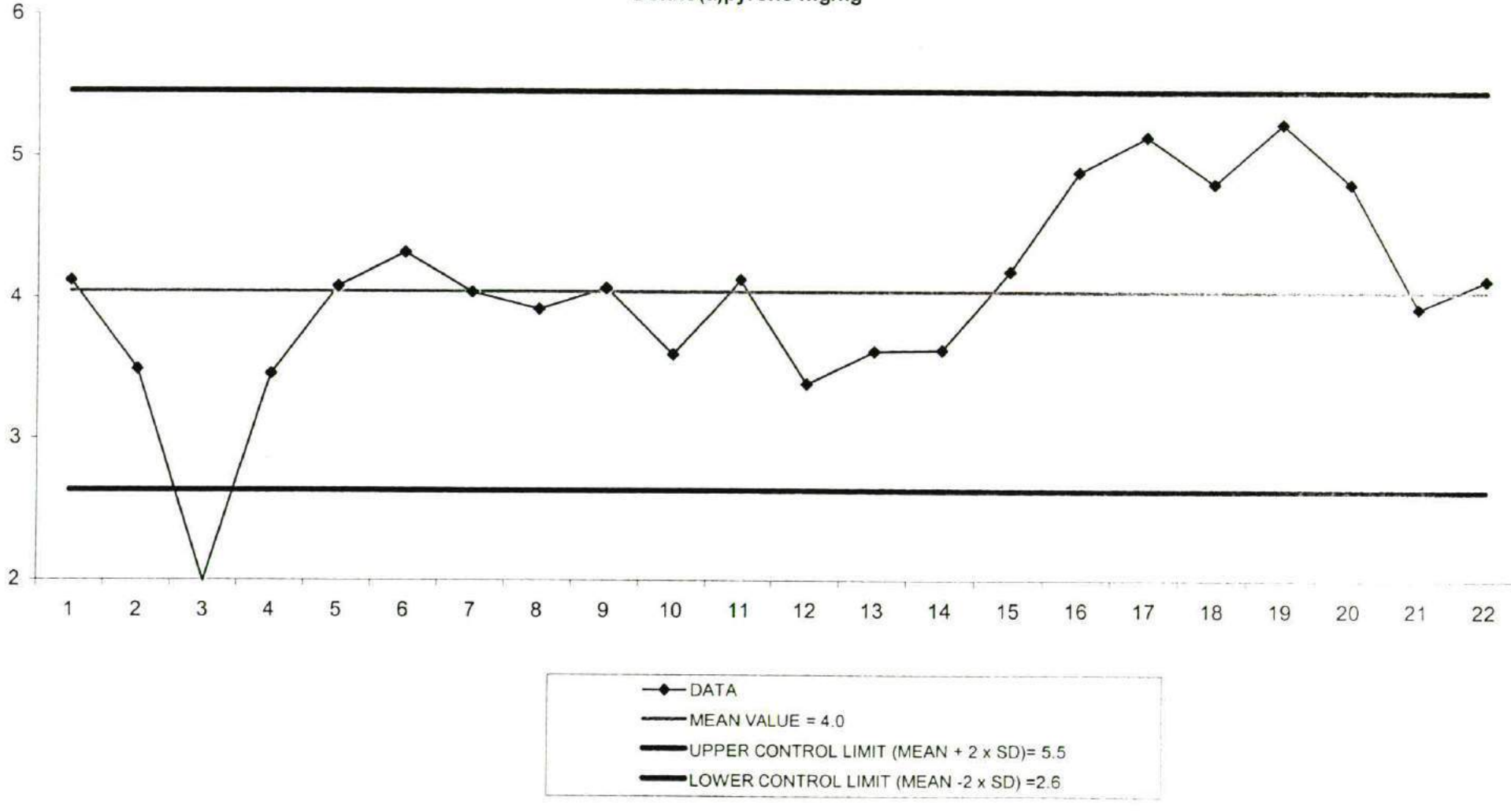
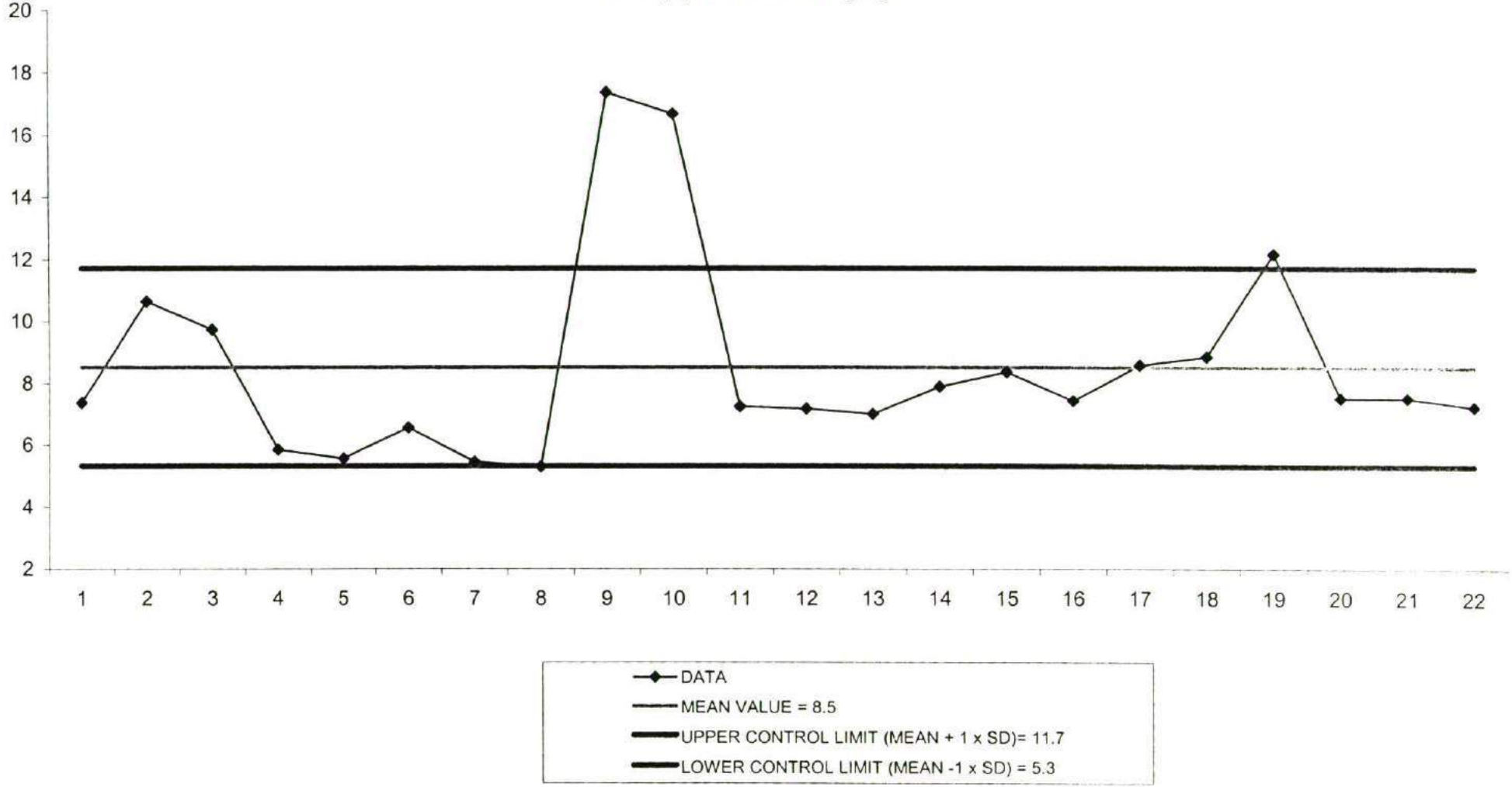


## CRM LGC 6140

**Benzo(b)fluoranthene mg/kg**



## CRM LGC 6140

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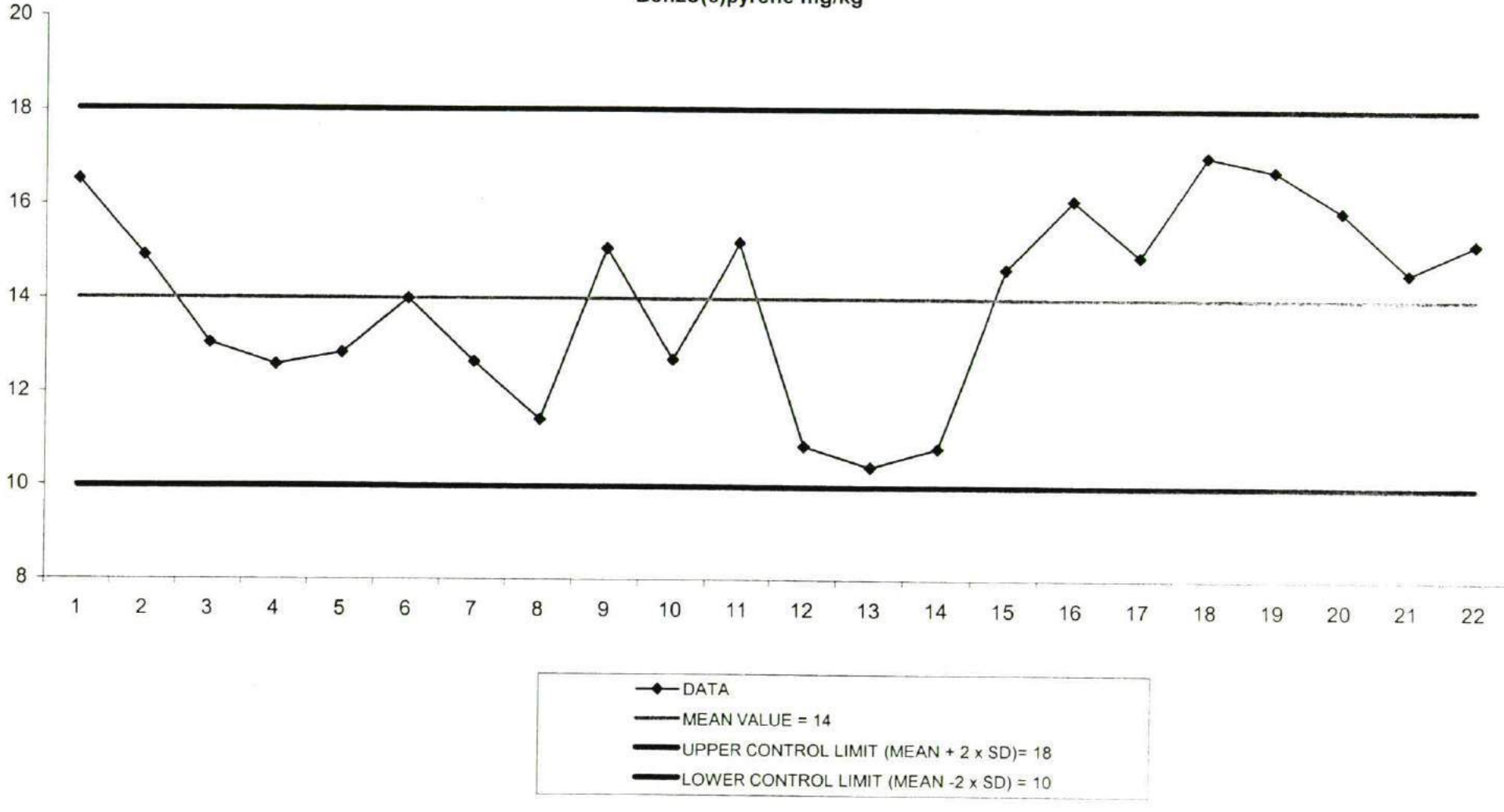
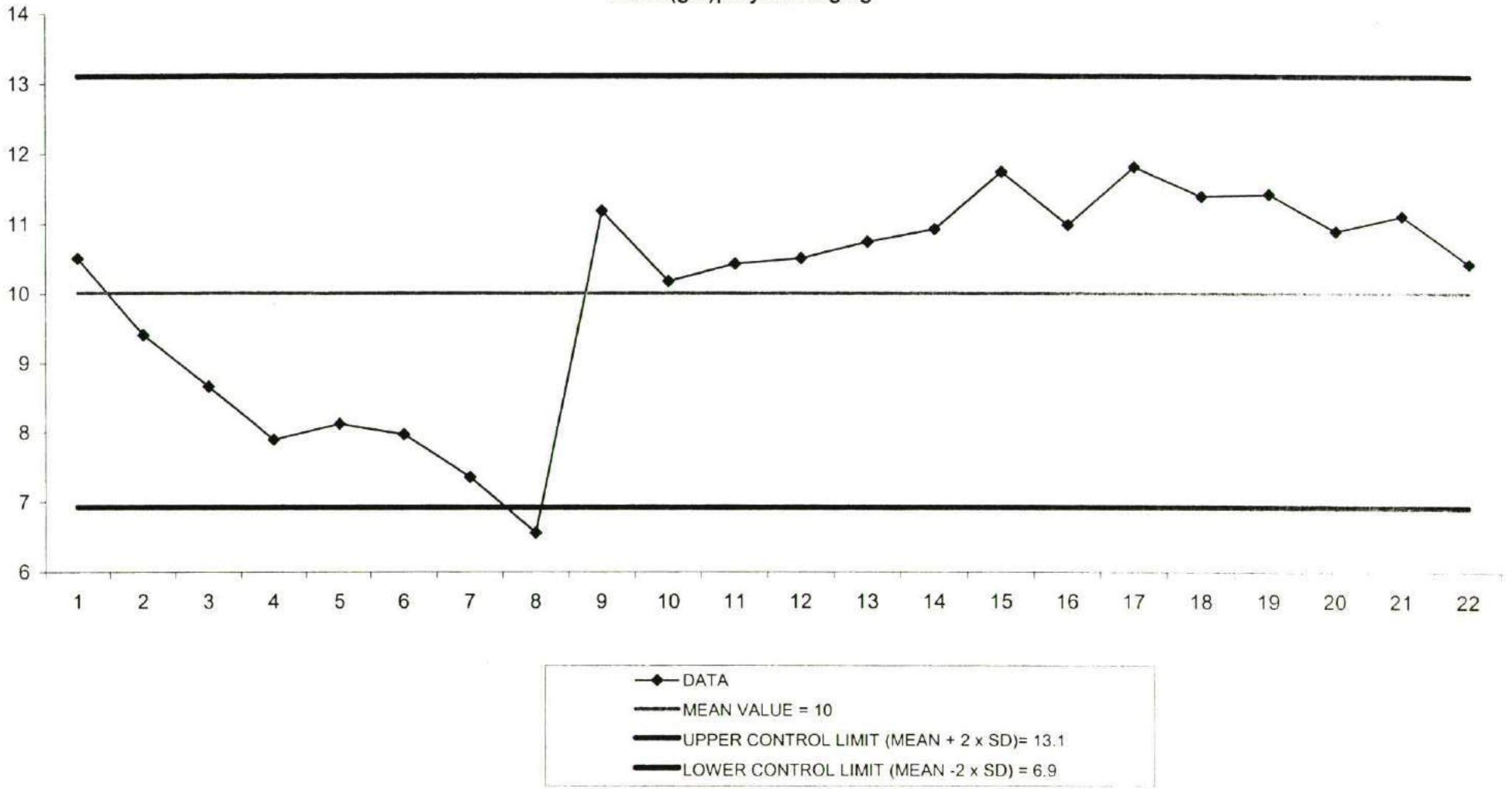
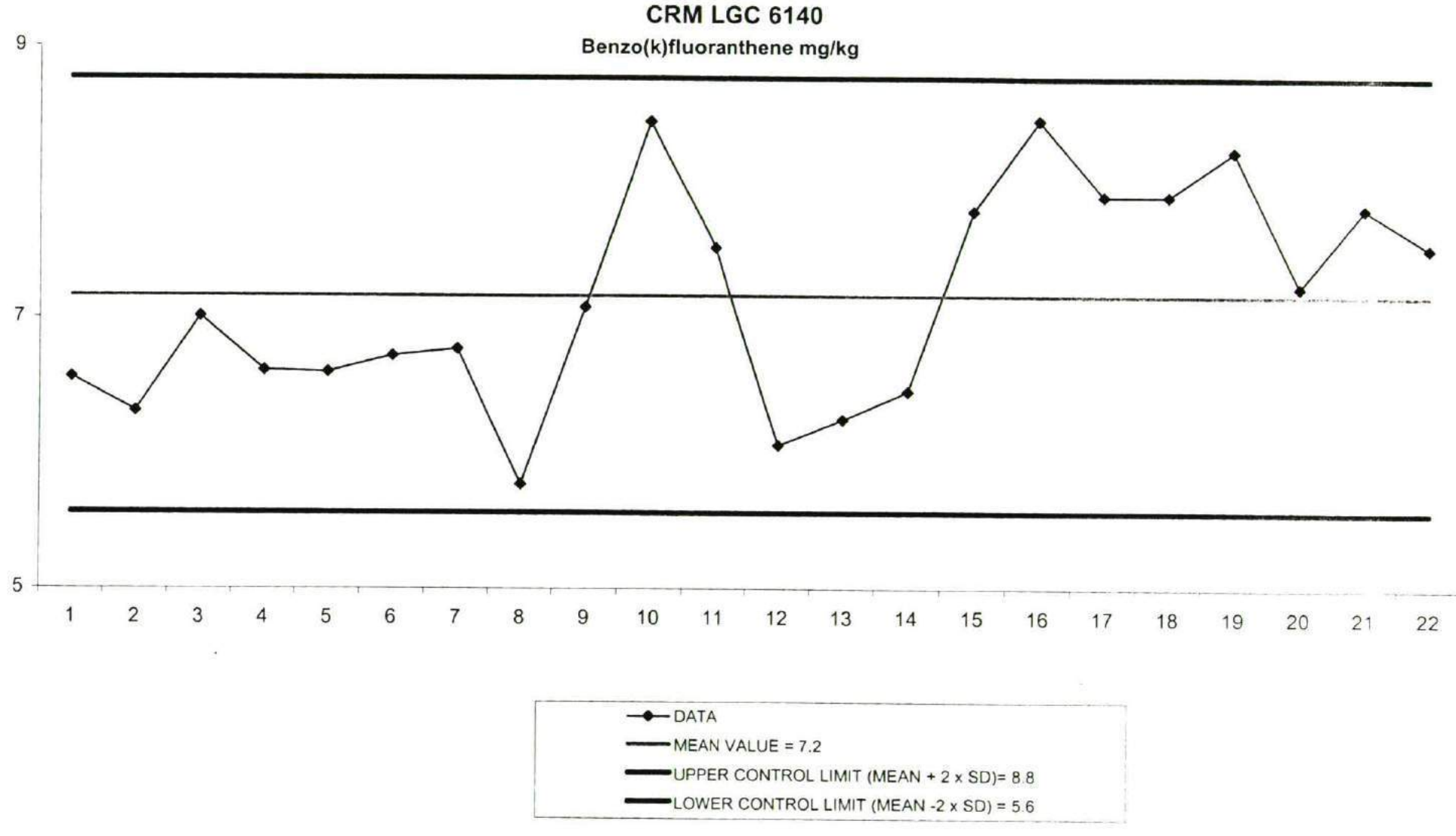


## CRM LGC 6140

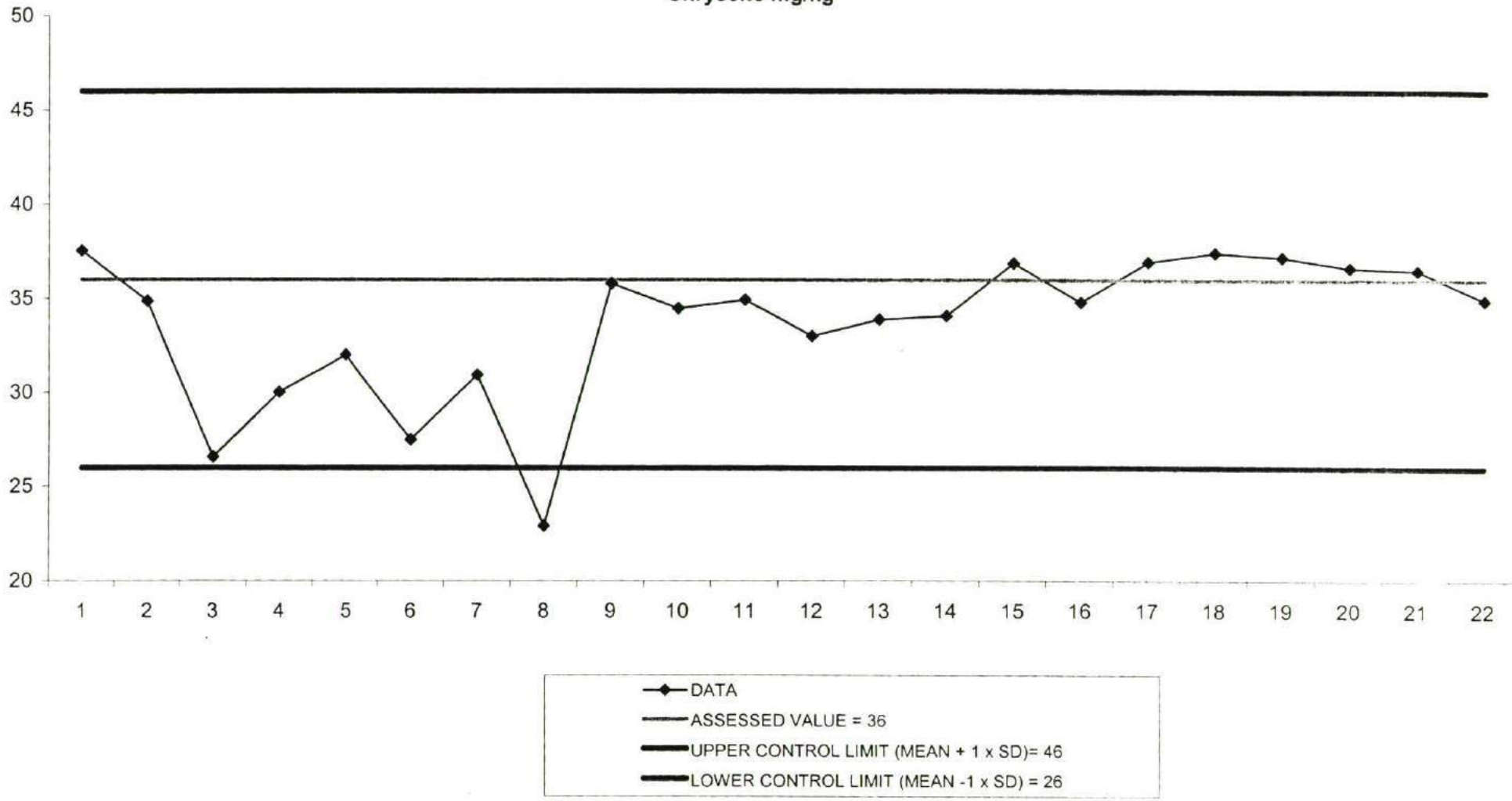
**Benzo(ghi)perylene mg/kg**




CRM LGC 6140
Benzo(k)fluoranthene mg/kg
9
7
5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
DATA
MEAN VALUE = 7.2
UPPER CONTROL LIMIT (MEAN + 2 x SD)= 8.8
LOWER CONTROL LIMIT (MEAN -2 x SD) = 5.6

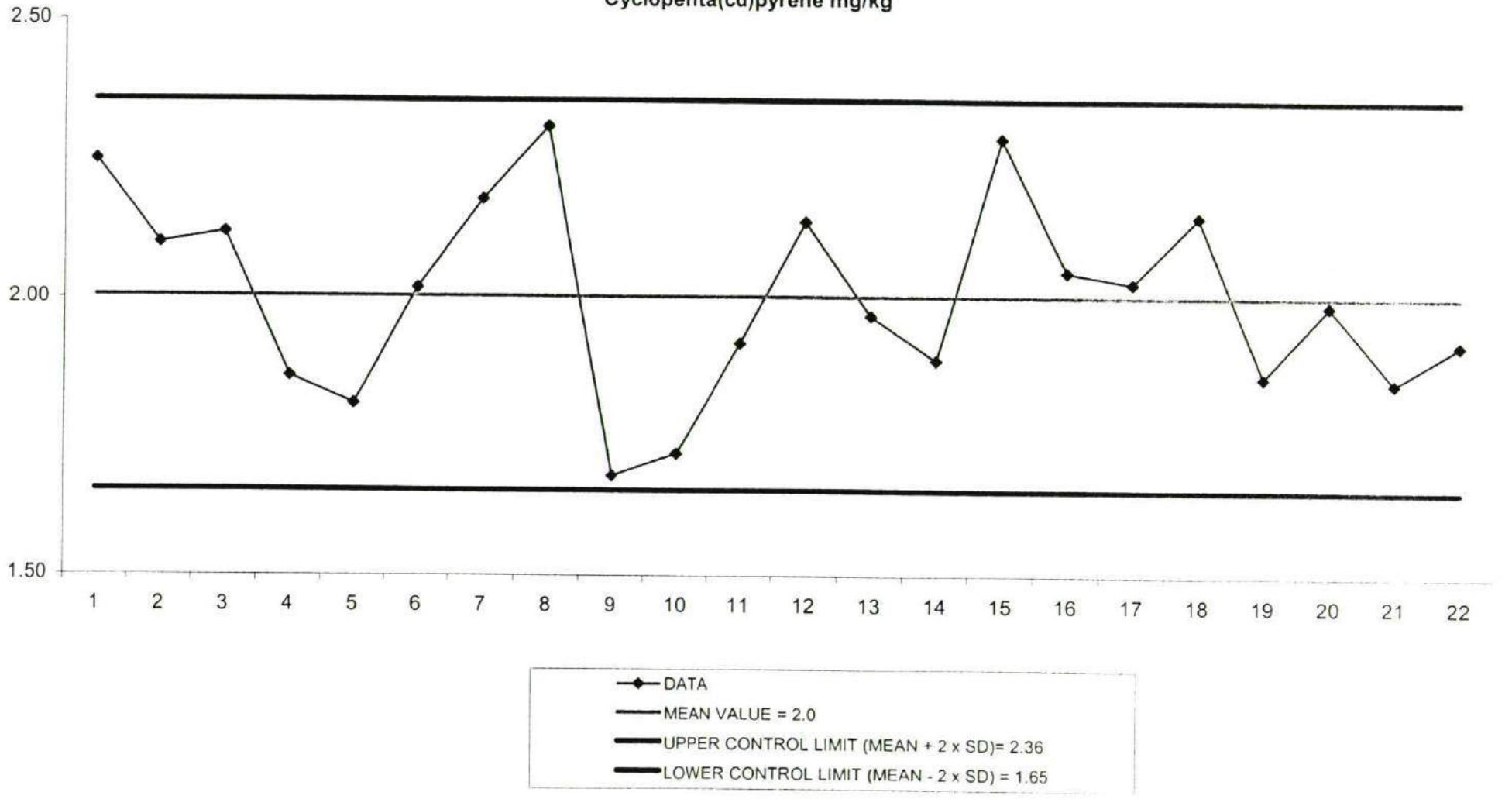
## CRM LGC 6140

**Chrysene mg/kg**



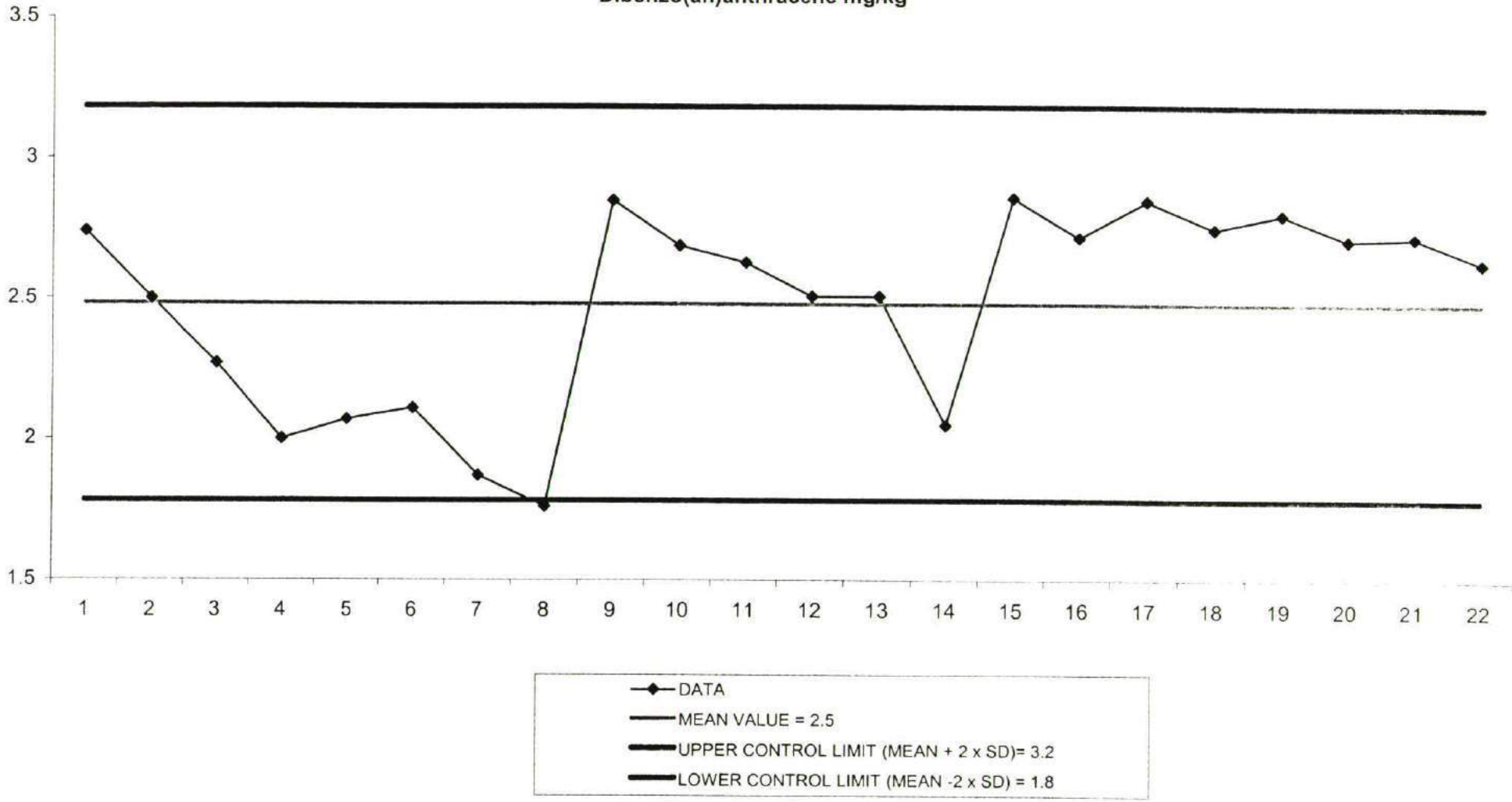
## CRM LGC 6140

**Cyclopenta(cd)pyrene mg/kg**



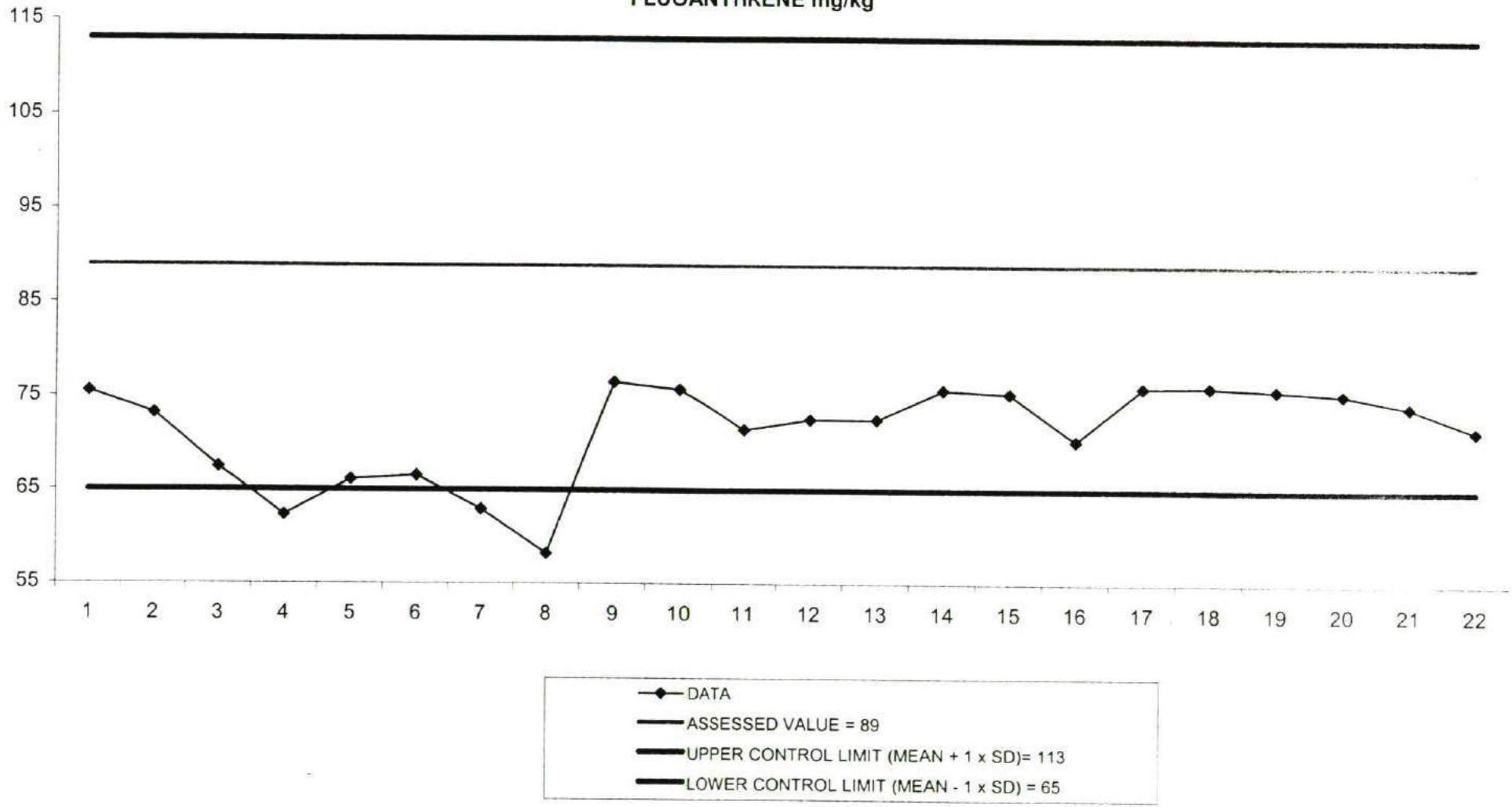
## CRM LGC 6140

**Dibenzo(ah)anthracene mg/kg**



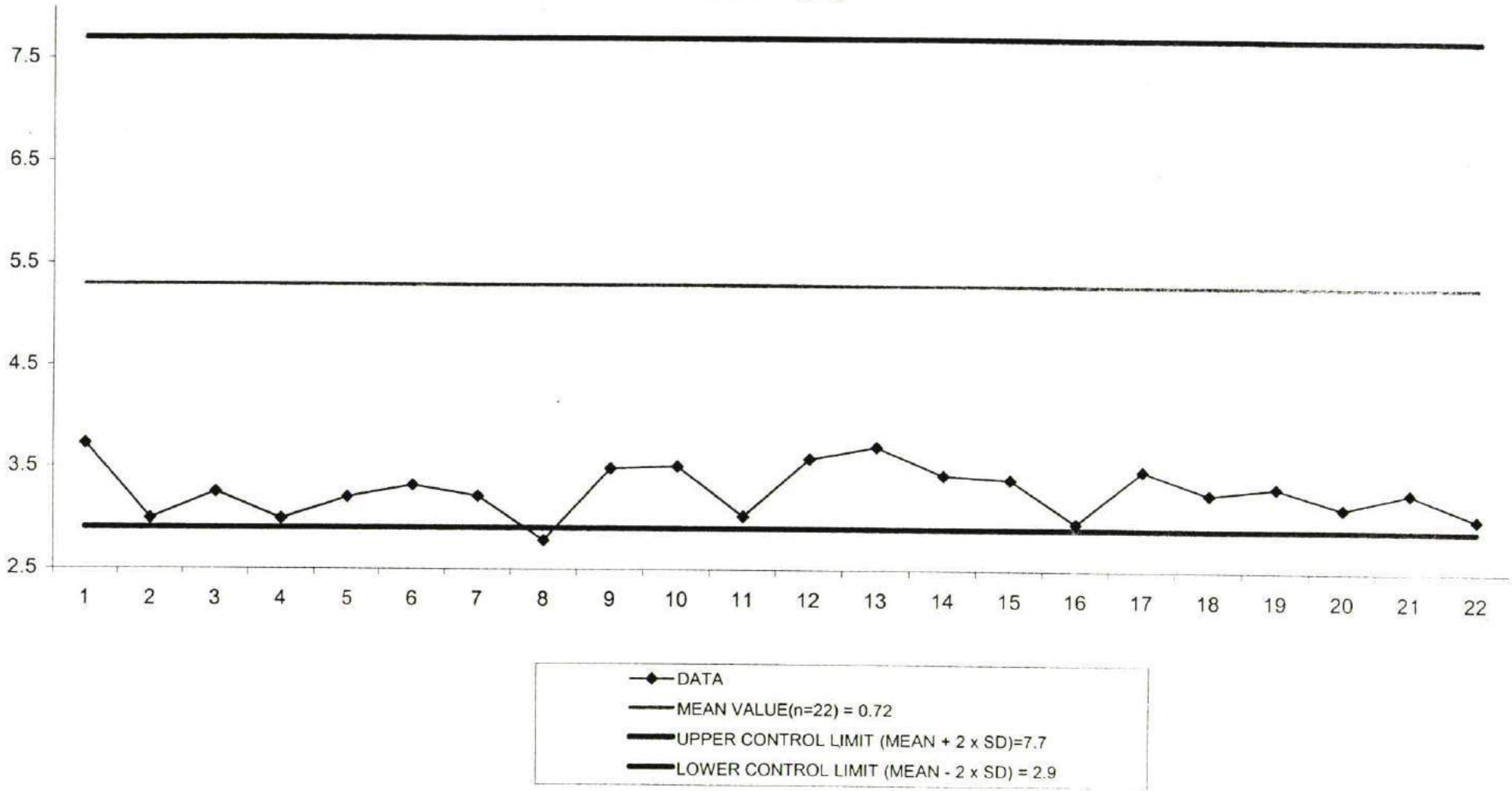
## CRM LGC 6140

**FLUOANTHRENE mg/kg**



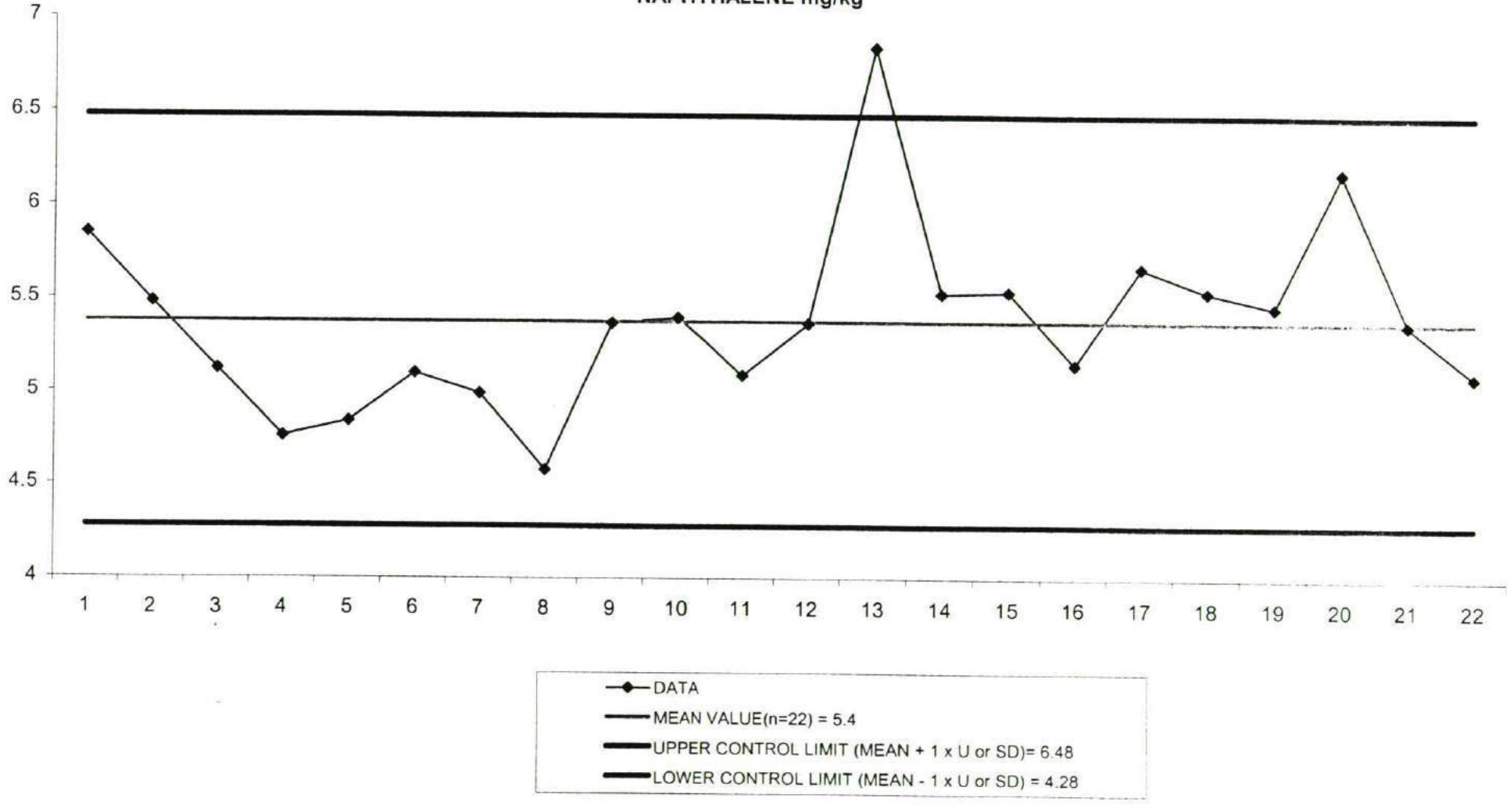
## CRM LGC 6140

**FLUORENE mg/kg**



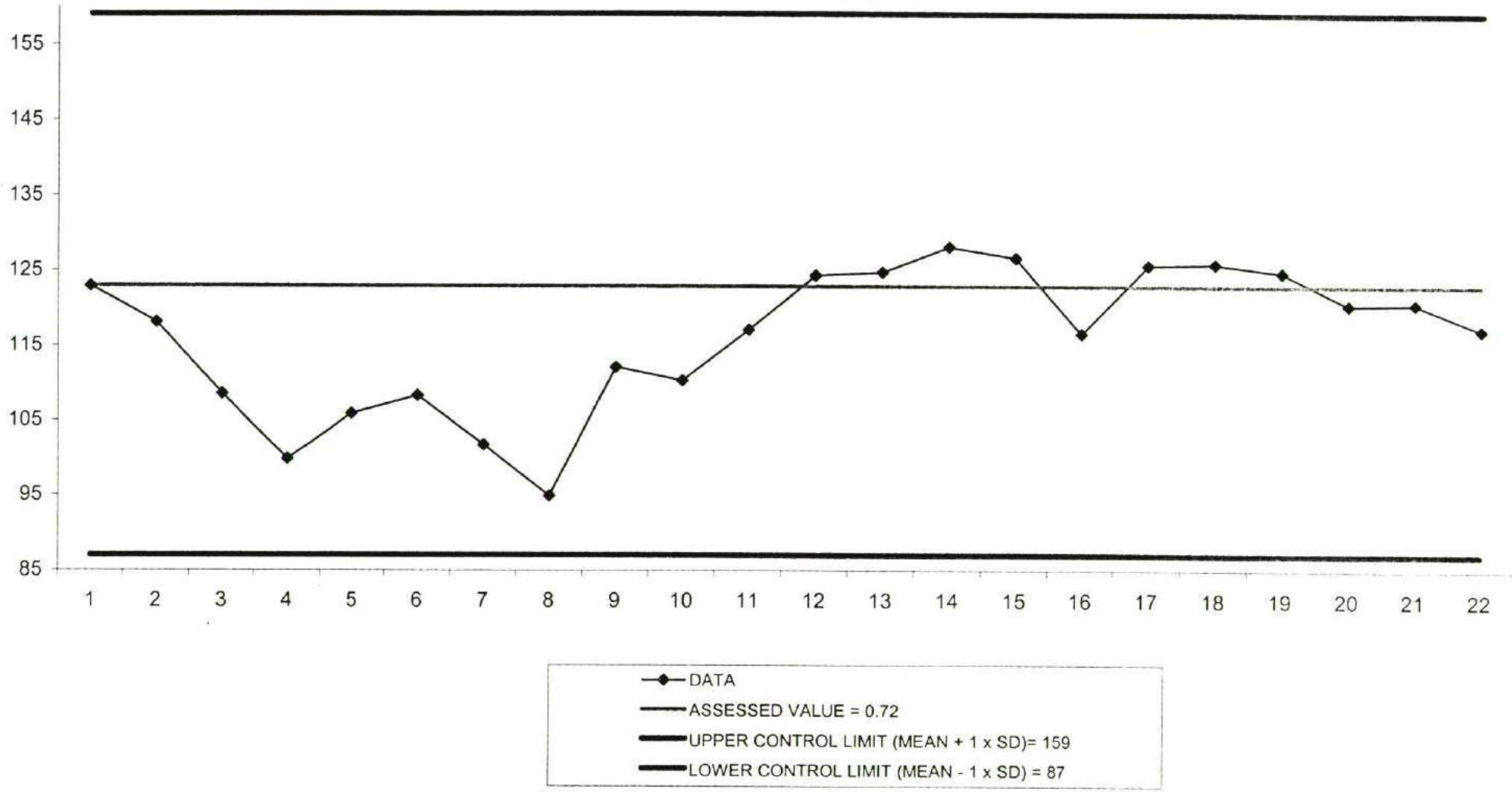
## CRM LGC 6140

### NAPHTHALENE mg/kg



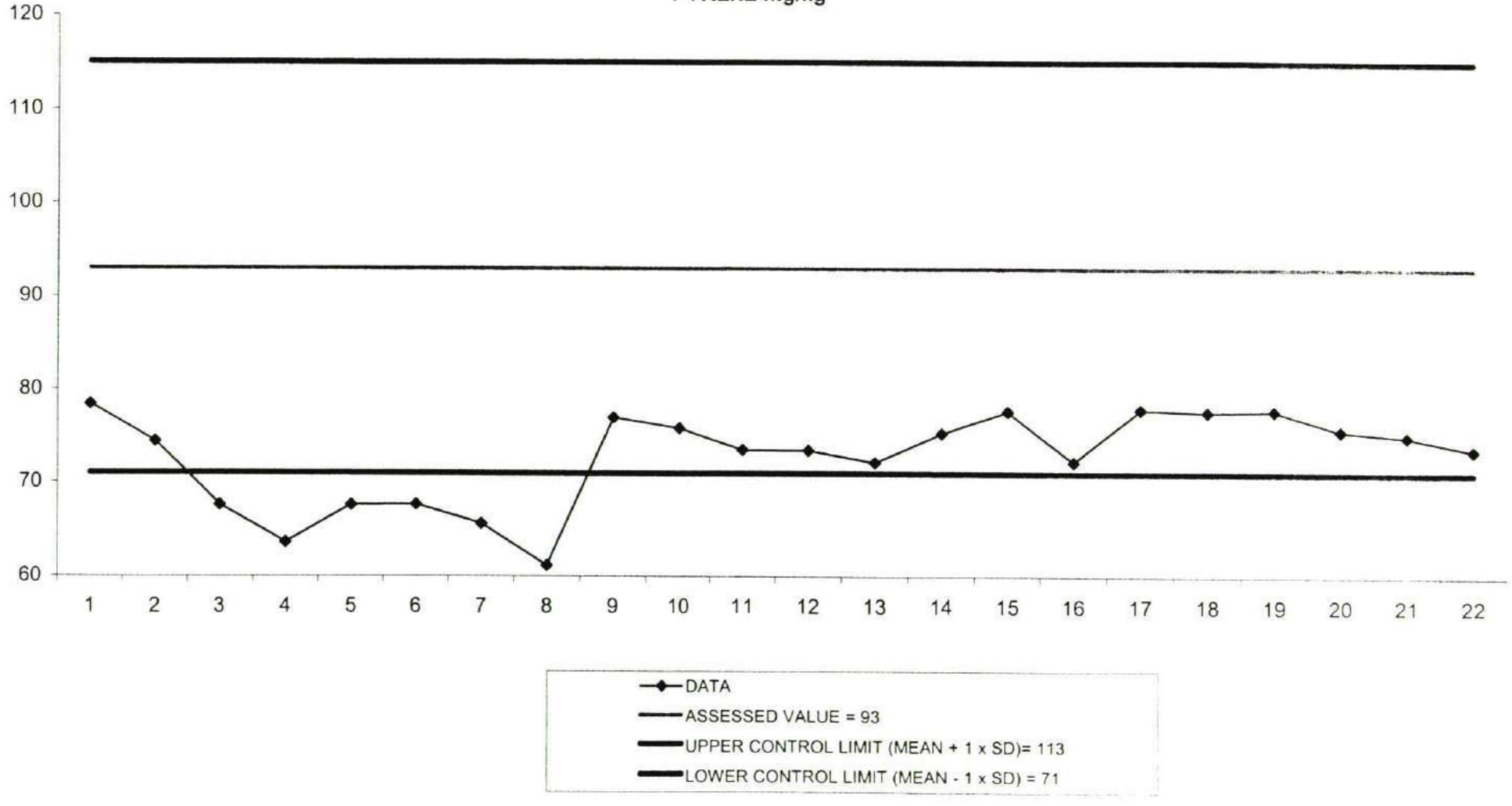
## CRM LGC 6140

**PHENANTHRENE mg/kg**



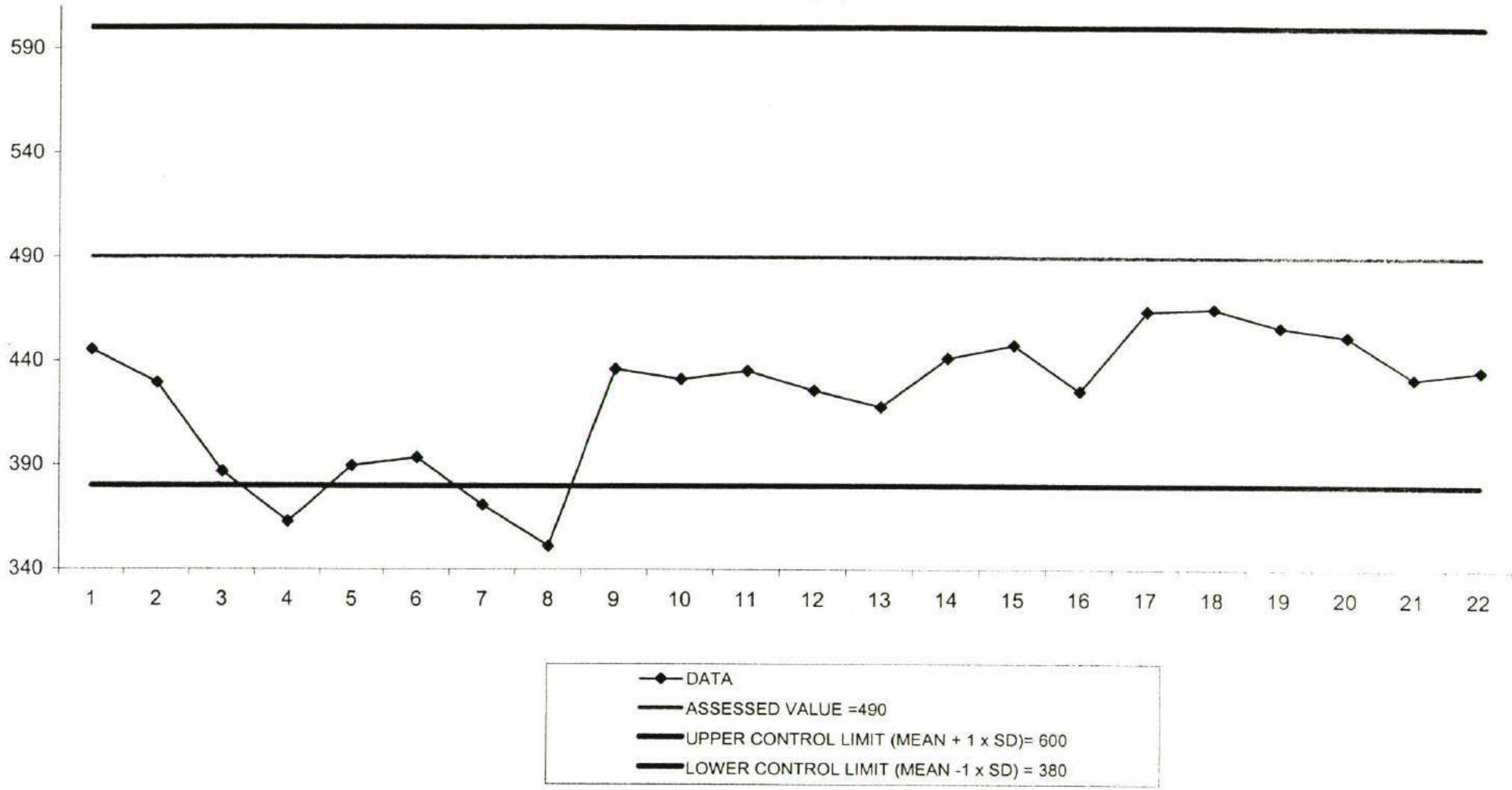
## CRM LGC 6140

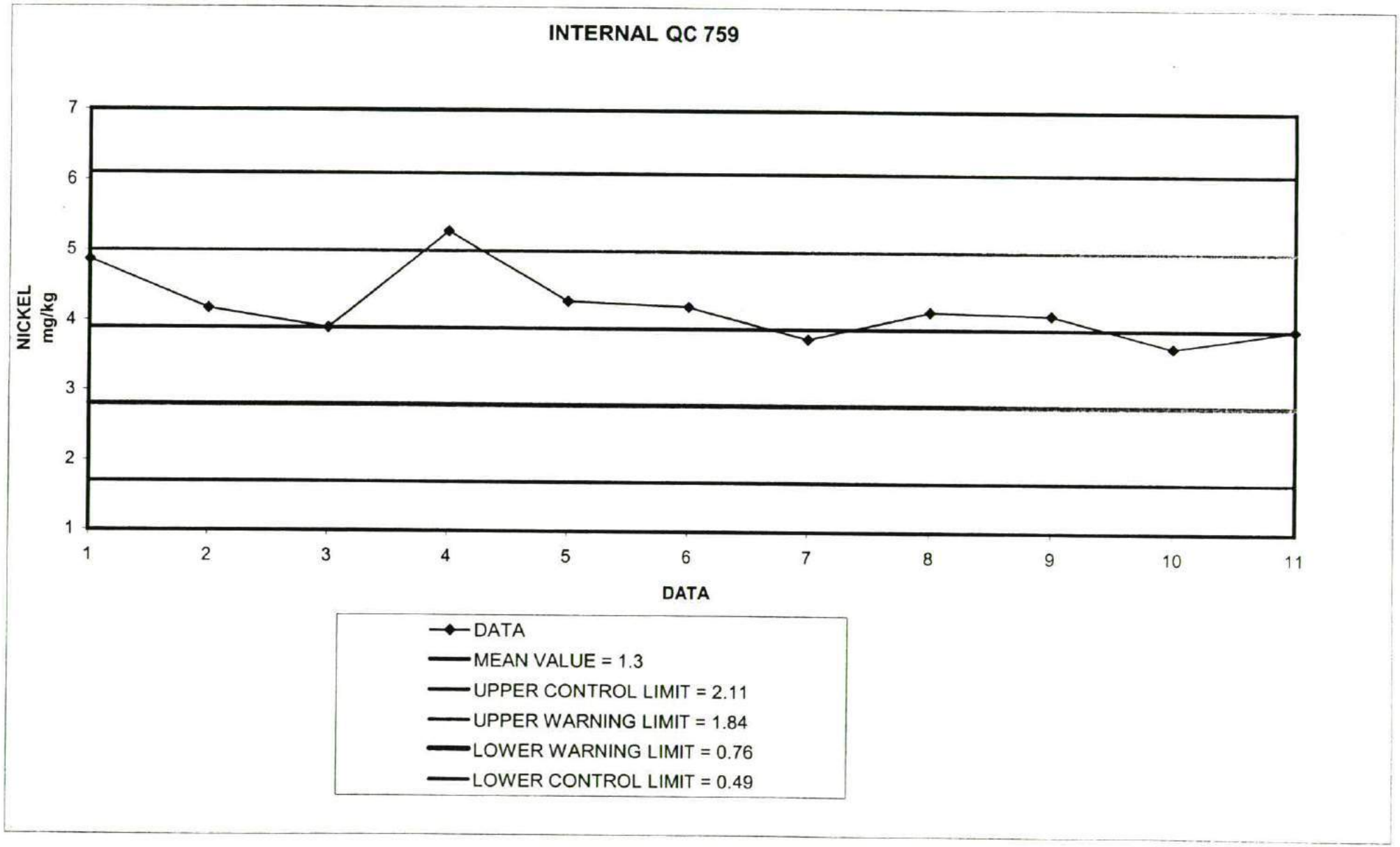
**PYRENE mg/kg**



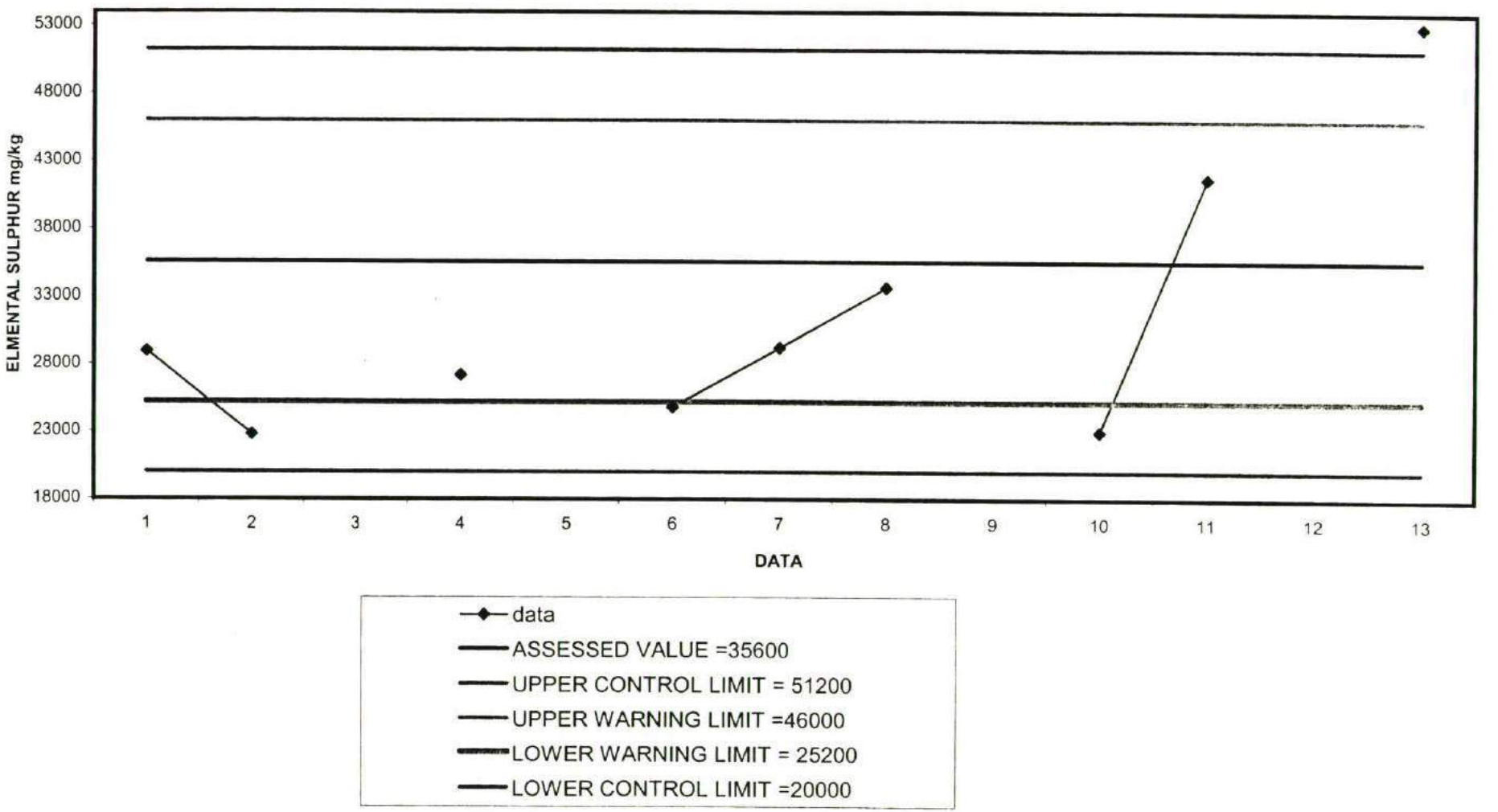
**CRM LGC 6140**

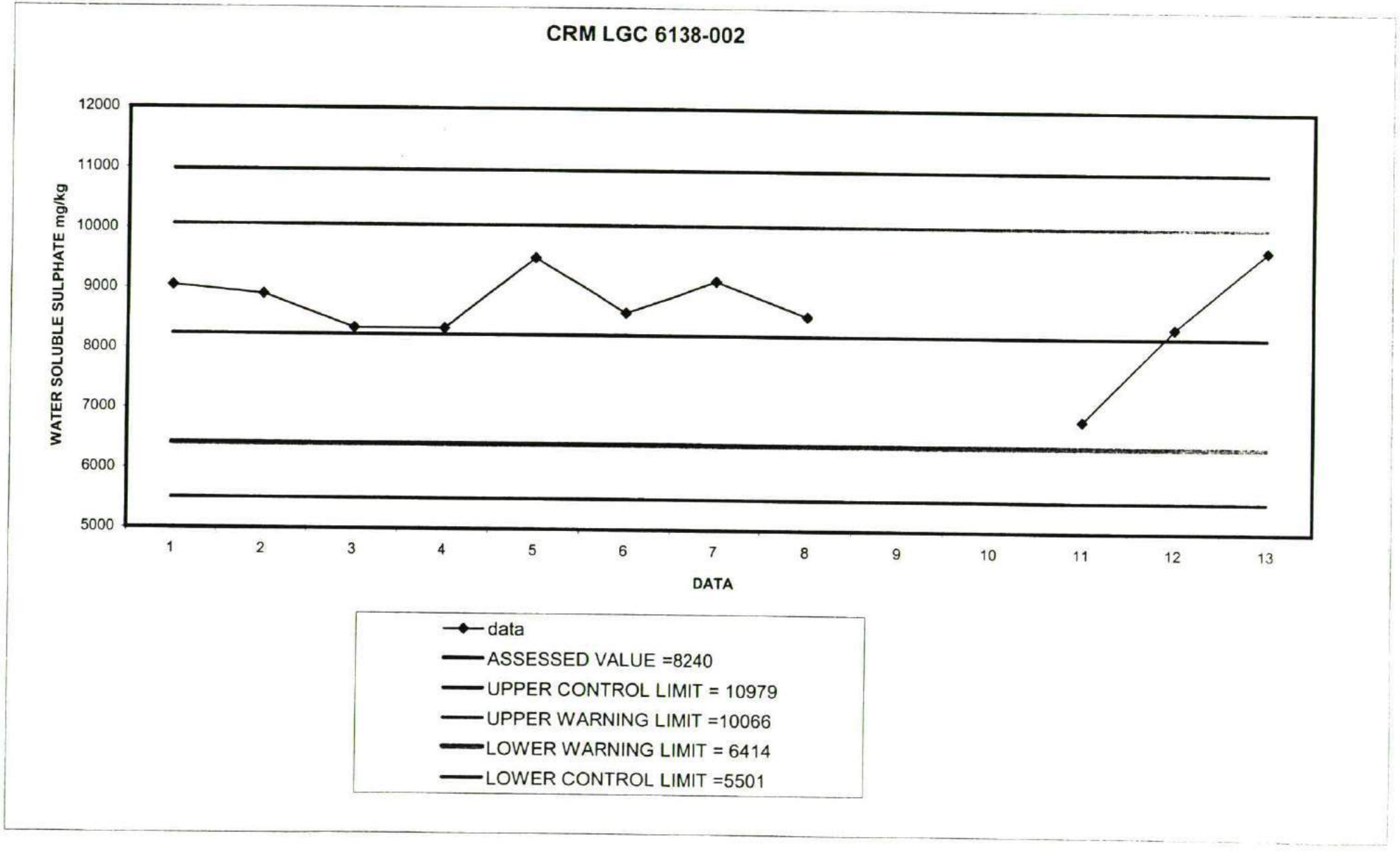
**Total PAH's mg/kg**




INTERNAL QC 759
NICKEL mg/kg
7
6
5
4
3
2
1
1
2
3
4
5
6
7
8
9
10
11
DATA
DATA
MEAN VALUE = 1.3
UPPER CONTROL LIMIT = 2.11
UPPER WARNING LIMIT = 1.84
LOWER WARNING LIMIT = 0.76
LOWER CONTROL LIMIT = 0.49

## CRM LGC 6138-002




CRM LGC 6138-002
WATER SOLUBLE SULPHATE mg/kg
12000
11000
10000
9000
8000
7000
6000
5000
1
2
3
4
5
6
7
8
9
10
11
12
13
DATA
data
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UPPER CONTROL LIMIT = 10979
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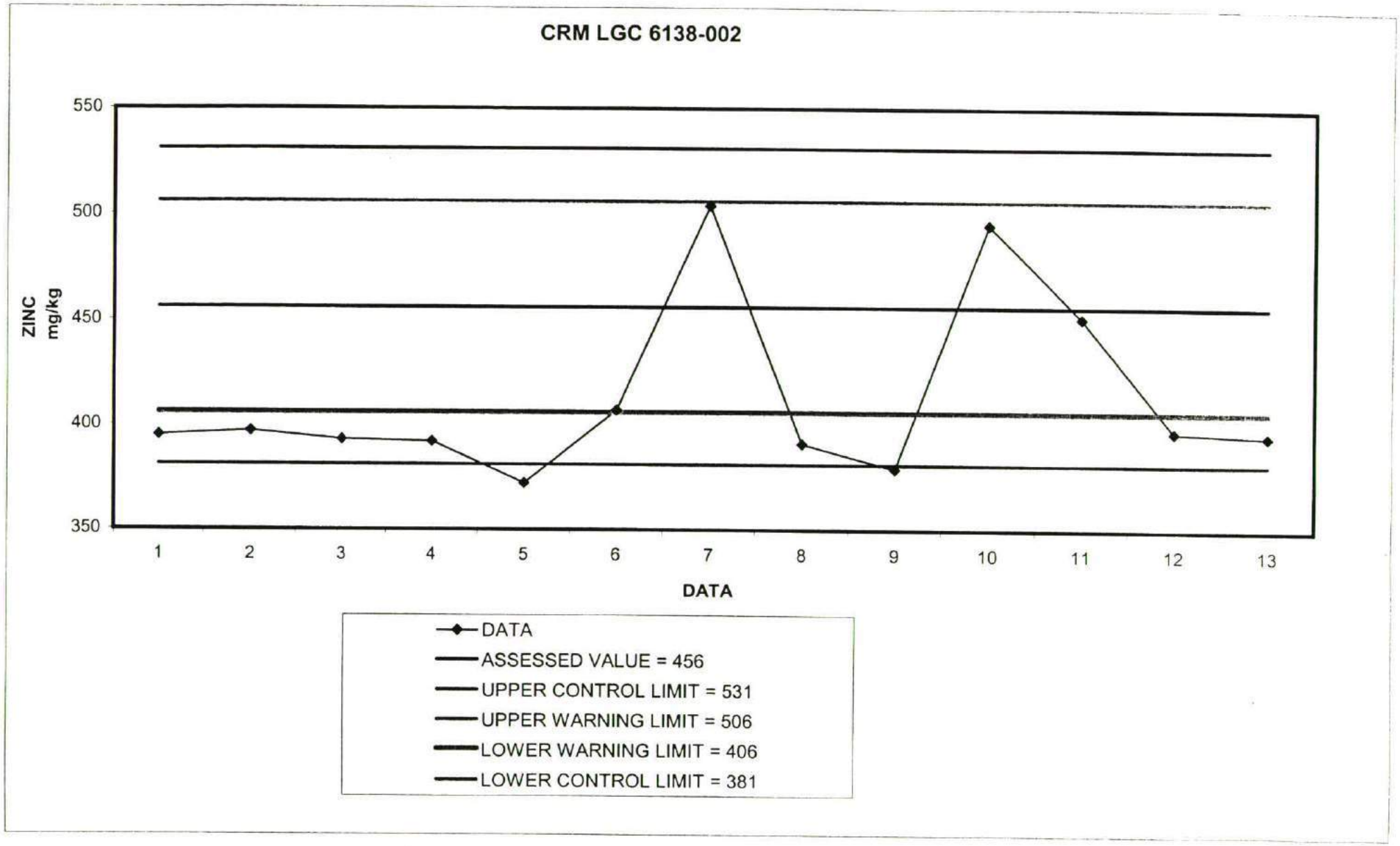
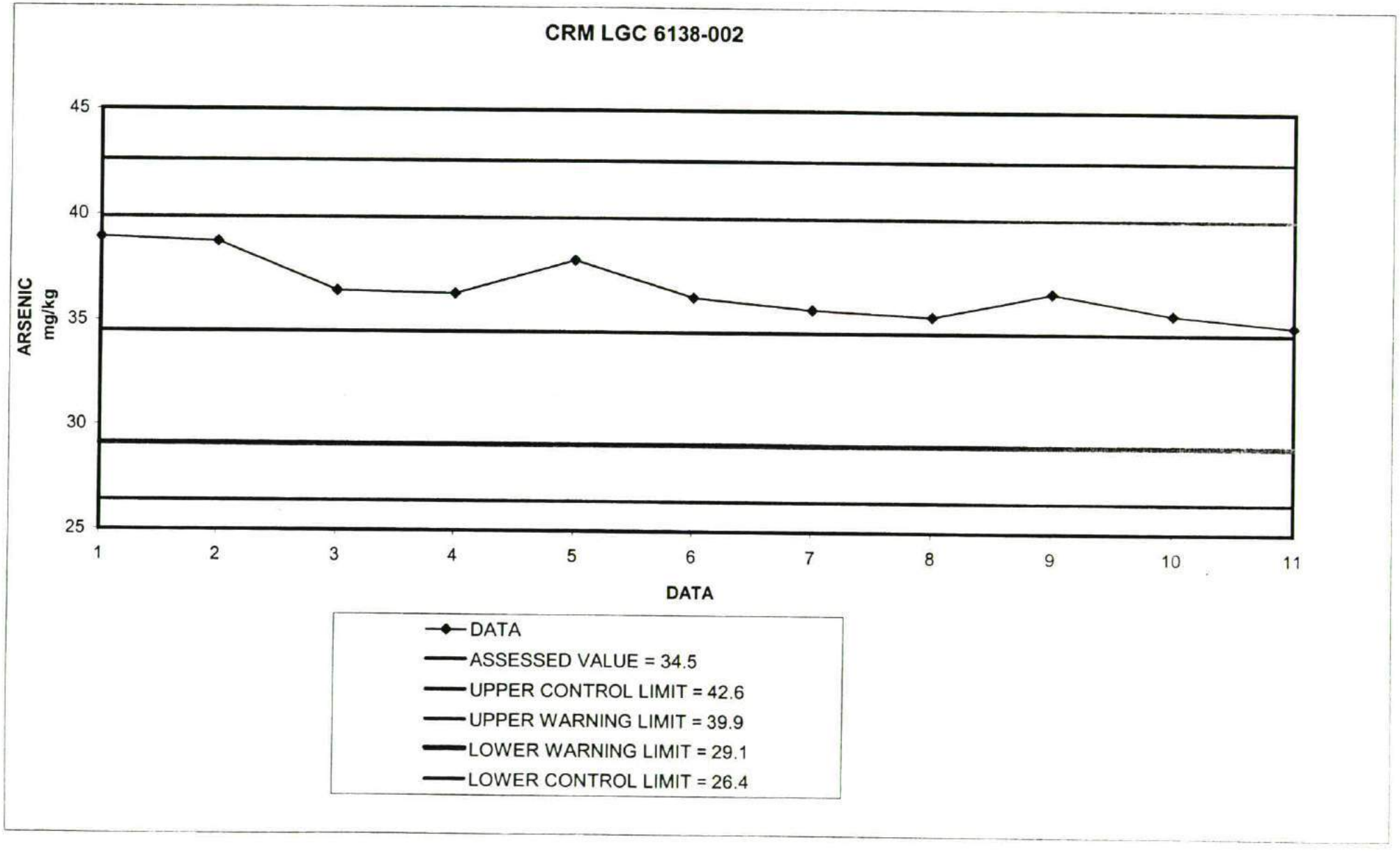
LOWER WARNING LIMIT = 6414
LOWER CONTROL LIMIT =5501


CRM LGC 6138-002
ZINC mg/kg
550
500
450
400
350
1
2
3
4
5
6
7
8
9
10
11
12
13
DATA
DATA
ASSESSED VALUE = 456
UPPER CONTROL LIMIT = 531
UPPER WARNING LIMIT = 506
LOWER WARNING LIMIT = 406
LOWER CONTROL LIMIT = 381


CRM LGC 6138-002
ARSENIC mg/kg
45
40
35
30
25
1
2
3
4
5
6
7
8
9
10
11
DATA
DATA
ASSESSED VALUE = 34.5
UPPER CONTROL LIMIT = 42.6
UPPER WARNING LIMIT = 39.9
LOWER WARNING LIMIT = 29.1
LOWER CONTROL LIMIT = 26.4

WS Atkins

# WHITE YOUNG GREEN ENVIRONMENTAL

PROJECT MAYFLOWER
STAGE 4 – ENVIRONMENTAL PLAN (EP)
SEVENOAKS (910547)

| ENVIRONMENTAL PLAN – SEVENOAKS (910547) | |
|---|---|
| **Prepared by** | **Reviewed by** |
| | |
| **ENVIRONMENTAL ENGINEER** | **SENIOR ENVIRONMENTAL ENGINEER** |
| ***File Reference:* P:EGE/TYPING/E0844/DETAILED ASSESSMENT/910547 SEVENOAKS** | |
| *White Young Green Environmental Ltd Yeoman House 63 Croydon Road London SE20 7TS* | |
| *Tel: 0208 659 9959 Fax: 0208 676 9968* | |

# Environmental Plan

## Cramptons Road, Sevenoaks (910547)

**13 July 2001**

**FINAL**

# Environmental Plan

Under the terms of the Site Transfer Agreement (STA), the following documentation constitutes the Environmental Plan for the following property:

## Cramptons Road, Sevenoaks (910547)

1) Site-specific environmental Detailed Assessment Report Ref BEN 45066/100.1 Issue 3, June 2001, received by WYGE on 10/07/01, (issued on behalf of SpectraSite Transco or the "Company")

2) Summary of site-specific requirements of Environmental Plan, overleaf (issued on behalf of Tadco)

3) Performance Specification for the proposed environmental aspects of site remediation works required on proposed radio towers sites REF:E0844 /DF/SPEC/SEPT2000/V5 DRAFT FOR DISCUSSION (issued on behalf of Tadco).

4) Signatory sheet (this page), signed by all parties

**This Environmental Plan is issued by Tadco on the understanding that the works summarised on the following page will be undertaken following transfer of site, but before construction, and with reference to the Detailed Assessment and Tadco's Performance Specification.**

**The works outlined in section 2.0 overleaf are classified as "Remedial Action and other measures" under the terms of the STA. The associated remediation costs, over and above normal construction costs, are expected to be in the order of £4500.**

| |
|---|
| 16/7/01<br>Signed on behalf of Lattice Telecommunications Asset Development Company (TADCO) |
| 16/7/01<br>Signed on behalf of SpectraSite Transco (SST) |
| Signed on behalf of Transco Asset |

# WHITE YOUNG GREEN ENVIRONMENTAL

## PROJECT MAYFLOWER
## STAGE 4 – ENVIRONMENTAL PLAN (EP)
## CRAMPTONS ROAD, SEVENOAKS (910547)

1.0 **This document provides a site-specific addendum to the Performance Specification for the Proposed Environmental Aspects of Site Remediation and Groundworks Required on Proposed and Existing Tower Sites (Ref: E0844/DF/SPEC/SEPT 2000/V5 DRAFT FOR DISCUSSION). It should be read in conjunction with the Parsons Brinckerhoff Ltd Detailed Assessment Report (BEN 45066/100.1 Issue 3) – July 2001 received by WYGE on 10/07/01 for the above site covering the physical ground contamination investigation works undertaken to provide an assessment of the site.**

2.0 The following site specific matters need to be undertaken as remedial actions or other measures as part of the construction works on the site, the final design and method to be submitted to and agreed by Tadco's environmental engineers (WYGE prior to works).

- The removal of soil in the GLA with a provisional minimum area of excavation 108m2, with a minimum depth of 0.5m. Suitable provisions should be made for the disposal of 54m3 of excavated soils (that are likely to classified as hazardous) with low permeability materials to be used to backfill the excavation.

- An environmental engineer shall continually observe the works. WYGE shall also be given adequate opportunity (minimum notice of 5 days) to attend. (Contact Mitch Cooke or Ian Gatenby on 020 8659 9959). In the event that any visual or olfactory contamination is identified, at the faces or base of the excavation, is shall be assessed in relation to whether it presents an unforeseen Tadco Environmental Matter. Accordingly, the works shall be extended subject to boundary and practical excavation limitations particularly with respect to adjacent services. A contingency plan and appropriate control measures for reacting to such a requirement shall be specifically considered within the Environmental Method Statement for the construction works.

- Monitoring and assessment of land gases shall be undertaken on at least one occasion prior to construction, to include methane, VOC's, carbon dioxide oxygen, pressure and flow. In the event that

monitoring is not undertaken, provision shall be made for landgas protection/ventilation of the proposed structure.

3.0 The following site specific matters need to be addressed prior to the commencement of construction works on the site.

- Consideration should be given to the potential presence of buried structures within the site, in particular any purifiers or tar tanks to the southern part of the GLA. Should these structures be encountered they must be removed in the presence of a Tadco environmental engineer (Contact Mitch Cooke or Ian Gatenby of WYGE on 02086599959) in a manner that does not allow the release of its contents in a way that may be detrimental to the environment. If evidence of former gasworks residues are suspected its contents should be chemically tested and it shall be assessed in relation to whether it presents an unforeseen Tadco Environmental Matter.

- If construction works proceed below the level of the groundwater table in a manner that necessitates the dewatering of the excavation, then an assessment shall be made of the effects of dewatering on the potential for the cross-boundary migration of contaminants. As a minimum this shall take into account the nature of the surrounding ground e.g. former gasworks structures etc., its permeability and the actual volumes of groundwater recovered. All recovered liquids should be disposed of in an appropriate manner with the agreement of the necessary Authorities according to the Duty of Care obligations.

- Construction workers should be made aware of the contaminants identified. A Health and Safety Plan should be prepared, covering issues such as handling, storage and disposal of contaminated soil and groundwater.

- Particular attention should be given to the decommissioning of the borehole as per LPH guidelines prior to construction.

- The Environmental Method Statement shall be submitted to WYGE for comment prior to siteworks commencing. This shall be formatted with due reference and assessment of available information at LPH, Basingstoke and WYGE London.

4.0 In addition, the Contractor shall give due consideration to the following:-

- The Contractor's attention is drawn in particular, to their Health, Safety and Statutory Requirements, as outlined in the WYGE Performance Specification (Ref: Section 1). These include requirements with respect to residual levels of soil contamination, including requirements for validation testing, but also requirements related to working within or adjacent to Transco operational areas.

- The disposal of sub-soil and/or groundwater associated with construction techniques will require detailed classification by the Contractors. Any removal and disposal of contaminated sub-soil arisings and/or groundwater should be undertaken in a controlled manner to a licenced facility, with due regard to Duty of Care responsibilities.

- The disposal of tank contents associated with the any potential tar tanks will require detailed classification by the Contractors. Any removal and disposal of contaminated contents should be undertaken in a controlled manner to a licensed facility, with due regard to Duty of Care responsibilities.

- Cost control associated with any remedial works must be tightly controlled and monitored and in-line with the requirements of appended Section 11.

Addendum to Performance Specification for the proposed environmental aspects of site remediation works required on proposed radio towers sites REF:E0844 /DF/SPEC/SEPT2000/V5 DRAFT FOR DISCUSSION

## 11. Cost Control/Apportionment

11.1 Following issue of the Detailed Assessment and the Environmental Plan, a financial test is performed to determine whether Tadco and the "Company", in accordance with the relevant clauses of the STAs entered into on 13th April 2000 and 8th June 2000, consider the cost of the remedial action to be acceptable given the value of the site.

11.2 In its simplest form, the financial test assesses whether the proposed value of remedial action exceeds 50% of the value of the site. Where proposed remedial costs do exceed this 50% threshold, Tadco may withdraw the site or the "Company" may agree to meet the additional costs.

11.3 In accordance with the STA, remedial action which is undertaken on sites after transfer of the site to the "Company" will be undertaken by the "Company" but at the cost of Tadco (save as to the costs of removing contaminated soil or other matter from the Property which shall be borne by the "Company" to a maximum of £3,000). Given the desirability for remedial action to be undertaken during construction work, it is anticipated that in most cases, the remediation work will be carried out post-transfer. However, in the unlikely event, where remedial action is undertaken prior to transfer, the work will be undertaken by Tadco (unless the parties agree otherwise).

11.4 For sites, where it becomes apparent during the construction works that the cost of remedial action will exceed the 50% threshold, the "Company" must consult Tadco at the earliest opportunity to agree such further action, the correct apportionment of costs, and to determine whether the "Company" agrees to meet the additional costs hence whether the lease or licence is to be terminated or not.

11.5 It is crucial that the costs associated with any remedial works are tightly controlled and monitored. Accurate records of associated costs will be maintained by the party carrying out the works and readily available to Tadco and the "Company" at any time during the course of the remedial work. To allow clear apportionment of between Tadco and "Company" costs, the following points must be considered:

11.5.1 As part of the remedial action and subject to consultation, Tadco will, in principle, agree to any necessary additional costs (provided total costs remain below the 50% threshold) associated with the remediation of unexpected materials not identified in the initial DA/EP but identified during the site works (these include landfill costs, importation of clean back fill, plant hire, extra personnel hours, laboratory analysis etc.). Tadco will not bear the additional costs associated with avoidable actions such as standing time due to failure to gain access, mis-classification of wastes etc. Cost records will be maintained so costs to Tadco and the "Company" can be clearly apportioned.

11.5.2 The basic "clean" soil removal costs which are required as part of both the remedial action and construction work will be borne by "Company" on the basis that these costs would have to be incurred in all cases to allow construction, regardless of the contamination status of the site. Tadco will bear the additional costs (i.e. the difference between the nominal 'clean' disposal cost and 'contaminated' disposal cost) associated with disposal of material required as a result of the remedial action specified in the Environmental Plan (subject to the financial test and save as to the costs of removing contaminated soil or other matter from the Property which shall be borne by the Company to a maximum of £3,000). For the avoidance of doubt 'clean' soil disposal costs not associated with any required remedial action do not count towards the £3,000.

11.5.3 In most cases where remedial action is required, the contamination will have resulted from historic processes, rather than current operational activities. In such circumstances, under current rules, landfill tax exemption can be obtained from Customs and Excise. It is the responsibility of the "Company" to apply for exemption and Tadco will not bear additional disposal costs associated with failure to obtain such exemption.

# DETAILED ASSESSMENT REPORT

## SEVENOAKS HOLDER STATION, CRAMPTONS ROAD, SEVENOAKS, KENT

Reference No. 910547

Mentor No. 11090

July 2001

PARSONS BRINCKERHOFF

100 YEARS

# DETAILED ASSESSMENT REPORT

## SEVENOAKS HOLDER STATION, CRAMPTONS ROAD, SEVENOAKS, KENT

**Reference No. 910547**

**Mentor No. 11090**

**July 2001**

**Prepared for:**
SpectraSite Transco Communications Ltd
Claremont House
Hatters Lane
Croxley Business Park
Watford
WD18 8TR

**Prepared by:**
Parsons Brinckerhoff Limited
Queen Victoria House
Redland Hill
Redland
Bristol
BS6 6US

| | | |
|---|---|---|
| Report Title | : | Detailed Assessment Report: Sevenoaks Holder Station, Cramptons Road, Sevenoaks, Kent |
| Report Status | : | Issue 3 |
| Job No. | : | BEN45066/100.1 |
| Date | : | July 2001 |
| Prepared by | : | ..... Dr Andreas Frey /Tim Greaves Dave Bissell |
| Checked by | : | ..... Dr Gary Graveling |
| Check Cat | : | B |
| Approved by | : | ..... A Limage |

**CONTENTS**

FIGURES



APPENDICES

## EXECUTIVE SUMMARY

SpectraSite Transco Communications Limited (SST) has commissioned Parsons Brinckerhoff Ltd (PB) to undertake an intrusive ground investigation of the Greenline Area at Sevenoaks Holder Station, Cramptons Road, Sevenoaks, Kent, TN14 5DY. This report describes the investigation undertaken and provides a detailed assessment of the environmental conditions and associated potential risks, on behalf of SST, and documents what remedial action or other measures, and associated costs of such action, are recommended to practically and appropriately minimise potential liabilities to Tadco in relation to contaminated land, soil and water which would otherwise be present prior to transfer of the site to the SST joint venture company.

| | |
|---|---|
| **Current Site Status** | Gas storage and distribution, proposed Greenline area disused. |
| **Site Investigation Details** | The investigation comprised the excavation of 2 No. trial pits and 1 No. borehole with associated soil and groundwater sampling. Trial pits and boreholes were excavated to investigate ground and groundwater conditions, together with any historical structures present. |
| **Environmental Assessment** | Following analysis of soil samples obtained during the investigation and comparison of the results with relevant screening criteria it is considered that concentrations of cyanide identified in the shallow Made Ground on site potentially pose a significant risk to human health and the environment. It is, therefore, concluded that there is a moderate statutory risk arising from the site to the SpectraSite-Transco joint venture. However, associated risks could be mitigated as recommended below.<br><br>The former tanks at the southern boundary of the greenline area were not encountered during the investigation and are not thought to pose a significant risk to the proposed development of the site. However, it would be considered prudent to bear in mind that the tank foundations may remain (as shown in trial pit TP1), and these should be removed as part of the construction phase.<br><br>Following the analysis of soil samples from the Natural Ground and the analysis of a groundwater sample obtained during the investigation, it is considered that identified contamination in the groundwater and sand and gravel aquifer derives from a combination of off and on site sources. The potential risk of a liability to Tadco with regard to statutory risks from contamination encountered in the Natural Ground and groundwater is, therefore, considered to be moderate. Additional constraints to the development of the site might be posed by aggressive ground conditions encountered during the site investigation. It is recommended that this be taken into consideration during the design of future foundation structures. |
| **Geotechnical Assessment** | The presence of surface Made Ground to some 1.8m to 2.2m depth, together with the presence of old footings extending to 1.35m depth and the underlying presence locally of topsoil / subsoil extending to some 2.8m depth, makes prevailing ground conditions unsuitable at this particular location for the proposed raft slab to be simply placed in the near surface soils. As such there are essentially two options at this location, as follows:<br><br>(a). construct the raft slab on a granular (or stone) mattress; or (b). resort to a piled foundation |
| **Recommendations and development issues/costs*** | In order to mitigate the site from statutory liabilities associated with significant cyanide concentrations in the shallow Made Ground, it is recommended that areas of cyanide contamination in the soil are removed and replaced with inert material to a depth of 0.5m below ground level. In addition it is recommended that a layer of gravel be placed in accessible areas to minimise human contact with elevated PAH concentrations in the Made Ground.<br><br>Budget costs for the recommended remedial works are estimated at approximately £4,500. Construction costs (removal of soils and instatement of a layer of gravel) would be in the region of £3,000-4,000. The above costs do not include for contractors set up, overhead and profit and can only be regarded as provisional estimates based on currently available data obtained from the ground investigation.<br><br>Following completion of ground water monitoring, it is recommended that borehole BH1 is decommissioned in accordance with the Project Mayflower Guidance Document (August 2000 V6). The estimated cost for this work is £1,500.<br><br>*Budget costs are given in Table 5.1 |
| This sheet is intended as a summary only of the assessment of the site in relation to ground contamination. It does not provide a definitive engineering analysis. | |

# 1 INTRODUCTION

## 1.1 General

1.1.1 SpectraSite Transco Communications Limited (SST) has commissioned Parsons Brinckerhoff Ltd (PB) to undertake an intrusive ground investigation of the Greenline Area at Sevenoaks Holder Station, Cramptons Road, Sevenoaks, Kent, TN14 5DY, currently owned by Tadco Limited (Tadco).

1.1.2 All work has been undertaken in accordance with the Project Mayflower Guidance Document, unless otherwise stated.

1.1.3 The principal objectives of the investigation were; to identify the nature and extent of potential soil and groundwater contamination; to provide an assessment of environmental risk; to provide preliminary remediation design and cost estimates; and to provide preliminary recommendations for foundation design.

1.1.4 This report describes the investigation undertaken and provides a detailed assessment of the environmental conditions and associated potential risks, on behalf of SST, and documents what remedial action or other measures, and associated costs of such action, are recommended to practically and appropriately minimise potential liabilities to Tadco in relation to contaminated land, soil and water which would otherwise be present prior to transfer of the site to the SST joint venture company on a 99 year lease.

## 1.2 Report Format

1.2.1 This report includes the following information:

- current site status – including the location and description of on-site and neighbouring development;
- site geology, hydrogeology and hydrology;
- site history including a review of available historic information;
- site investigation summary including logs, field and laboratory data;
- an environmental assessment of the soils and water encountered;
- comment on potential liabilities;
- proposal for site remediation and mast foundation.

# 2 SITE AREA

## 2.1 Site Location and Description

| Table 2.1: Site Information | |
|---|---|
| **Site Address** | Sevenoaks Holder Station, Cramptons Road, Sevenoaks, Kent, TN14 5DY. |
| **Telephone Number** | - |
| **National Grid Reference** | TQ 547168 |
| **Reference Number** | 910547 |
| **Mentor Number** | 11090 |
| **Greenline Plan Number** | V1. 02/08/00 |
| **General Environment** | The Greenline area is situated in the south eastern corner of a Transco gas holder and distribution compound. (See figure 1 & Greenline plan in Appendix E). The surrounding land uses comprises:<br>• North – Open ground and gravel pit beyond Otford Road;<br>• North East – Residential housing and Vestry industrial estate beyond gas holder station;<br>• South – Commercial / industrial estate and residential housing,<br>• West – Open ground of Sevenoaks Wildfowl Reserve and East Lake beyond Otford Road,<br>• East – Residential housing beyond gas holder station. |
| **Current Site Use** | Gas storage and distribution, proposed Greenline area disused. |
| **Proposed Site Use** | The erection of a third generation mobile telephone telecommunication radio tower is proposed within the Greenline area. |
| **Site Access** | Access to the gas holder station is gained via locked gates in the car park of the industrial estate (DIY centre at time of writing) off Otford Road. |
| **Site Topography** | The gas holder compound is generally level, with the gas holder base, north of the Greenline area, lying approximately 2.0m below the rest of the site. |
| **Ground Cover** | The cover within the Greenline area comprises mainly concrete hardstanding with patchy grass, scrub, and loose chippings on the eastern margin. The rest of the gas holder station is covered by a mixture of hardstanding, gravel and grass, some areas of tipped rubble are also present. |
| **Plant and Equipment** | An above ground gas holder with valve pit lies directly to the north of the Greenline area. An above road pedestrian gantry links the site to a second gas storage and distribution compound to the east. |
| **Site History** | Limited historical plans suggest that the current gas distribution compound and Greenline area formed part of a Gasworks since before 1909 and until 1960-64 when the gasworks was decommissioned. The historical Gasworks site extended beyond the current gas holder compound site |

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| | boundary, to the south and south east.<br><br>In 1909, three gas holders were present within the old gasworks boundary located to the west and south west of the Greenline area. Historical information from 1936 shows that the southerly most holder has been removed and a new, larger third holder built in the northern corner of the site immediately north of the Greenline area. The gasworks to the south of the current gas holder compound shows expansion at this time, with 6 undesignated tanks and other structures associated with increasing gas production. Immediately to the south of the Greenline area are shown two miscellaneous tanks and a rectangular structure. Plans from 1959 show numerous changes in the overall gasworks layout together with the removal of the tanks mentioned above. The three gas holders are still present.<br><br>Currently, the gas holder immediately north of the Greenline area is present together with a more recent gas holder and development to the east and north east.<br><br>The DTA states that a 1997 site survey shows the Greenline to be in an area used as "gas purifying, with several tanks at the southern boundary". these tanks are marked as above ground structures on historic plans and were not encountered during the investigation. |
| **Geology** | Made Ground over the Folkestone Beds Formations (sands and gravels) over the Tunbridge Wells Sands (part of the Cretaceous Wealden, Hastings Beds described as yellowish sands with beds of sandstone thickening westwards to 55 to 122m). |
| **Hydrogeology** | The Folkestone Beds consist of sands and gravels, with groundwater flow being controlled by intergranular flow. The Folkestone Beds are classified as a Major Aquifer by the Environment Agency and are considered of local importance for public water supply. The deeper Tunbridge Wells Sands are classified as a Minor Aquifer by the Environment Agency and possess an intergranular and fracture flow mechanism. |
| **Hydrology** | Drainage within the gas distribution compound is to surface water sewers with oil interceptors.<br><br>East Lake, part of the Sevenoaks Wildfowl Reserve, lies 100m to the south west of the gas holder compound boundary. Various small drainage features operate within the nature reserve, draining into the lake. The Moors Wood, a local wood and lakeland area lies approximately 250m to the north east of the gas holder compound boundary. The River Darent, a quality D (fair) river lies approximately 600m to the north west of the gas holder compound boundary. A covered reservoir is located approximately 100m to the east of the gas holder site boundary, the hydraulic nature and continuity with local groundwater of this reservoir is unknown. |
| **Services** | Service plans provided by Transco are provided in Appendix E. |
| **Environmentally Sensitive Areas in the Vicinity of the Site** | Two groundwater abstraction wells lie 500m north of the site. East Lake and the Sevenoaks Wildfowl Reserve are both environmentally sensitive areas in the vicinity of the site. The Moors Wood and lakeland area along with the River Darent are both further possible environmentally sensitive areas, near the site. With the exception of local residential housing and the covered reservoir, there are considered to be no further major environmentally sensitive areas in the vicinity of the site. |
| **Potential Sources of off Boundary Contamination** | The completeness of the decommissioning of the gasholder on the western boundary of the Greenline is unknown. No underground tank structures were encountered during investigations within the Greenline area. It is, therefore, possible that the purifying tanks are located just south of the Greenline boundary – thus being a possible source for cross |

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|---|---|
| | boundary migration of contaminants. The historical nature of the Vestry Industrial Estate, located to the of the Greenline area has not been verified, but the possibility of historical contamination associated with past industrial processes exists. |

| Table 2.2: Previous Work | |
|---|---|
| **Previous Reports** | Stanger (1997), Report - 8440/BGAAT7/jz<br><br>Harrison (1992), Boundary Survey, Report – C1935/22<br><br>Alfred McAlpine Homes South Limited (1985), Report on Ground Contamination With Proposed Remedial Measures – Residential Development, Cramptons Road, Sevenoaks. |
| **Summary of DTA** | DTA used ref: EO844/SummarySheets/Cons Final/910547FV1.Sevenoaks<br><br>Exploratory investigations were previously conducted within the Greenline area. Significant levels of contamination (Total Cyanides 900 – 10,000 mg/kg, Phenols at 1200 mg/kg and PAH at 1,000 – 5,000 mg/kg) were identified from below ground tanks and purifier boxes. Remediation, with elevated disposal costs was considered necessary. Spread foundations likely solution.<br><br>The Risk Rating assigned to Land Ownership within the DTA was MEDIUM.<br><br>The Risk Rating assigned to Construction/Operation within the DTA was MEDIUM to HIGH. |
| **Information Sources** | 1:63 360 Geological Survey Sheet 287 Sevenoaks (Solid and Drift Edition)<br><br>NRA Regional Appendix for the Southern Region.<br><br>Lattice Property Record Library.<br><br>Previous Desk top assessment (DTA) |

## 2.2 Site Walkover

Summary of Site Walkover

2.2.1 A site walkover was undertaken prior to investigative work. The inspection was undertaken to identify the present status of the site and identity any issues that might hinder the smooth running of the programme of works, such as vegetation and/or access etc. No such issues were identified at the time of the visit. Site photographs are presented in Appendix A of this report.

2.2.2 During the site visit, no visual contamination was identified at the site.

# 3 SITE INVESTIGATION

## 3.1 On Site Activities

3.1.1 The investigation comprised the excavation of a total of 2 No. trial pits (TP1 and TP2) using a JCB 3CX excavator and 1 No. borehole (BH1) using a water flush rotary coring drill rig (Pioneer) on 12 March 2001. In addition a piezometer was installed within the borehole to sample groundwater and one trial pit to sample perched water (if any) and land gas. Trial pits were extended until proof of Natural Ground, where possible. The borehole was extended to a maximum of 10m below ground level (bgl). Representative soil samples were collected and submitted for laboratory analyses. Sample collection, storage and analyses were undertaken in accordance with the Project Mayflower Guidance Document.

3.1.2 Trial pits and the associated piezometer were located to prove historical structures and to investigate the nature of the Made Ground/Natural Ground and possible water and gas within the Made Ground at the site. The borehole was positioned to monitor the depth and quality of possible groundwater and to assess the geotechnical parameters of sub-surface strata. Trial pit and borehole locations are shown on Figure 2.

3.1.3 The location of trial pits along the southern boundary of the site to investigate possible cross boundary underground tanks was not possible due to the suspected presence of extensive underground services in this area.

3.1.4 Groundwater and gas monitoring within borehole BH1 and the piezometer (BH2) in trial pit TP2 was undertaken on 12 March 2001. Levels of carbon dioxide, methane and oxygen in both the piezometer and borehole BH1 were recorded. Following purging, groundwater was sampled for laboratory analysis. Measurements of conductivity, dissolved oxygen, pH, and temperature were recorded on site.

## 3.2 Ground Conditions

3.2.1 All ground conditions encountered were logged by an engineer from PB in accordance with the requirements of BS5930 (1999). Photographs of the trial pits and arisings and detailed logs are provided in Appendices A and B respectively. A summary of encountered ground conditions is given below.

Made Ground

3.2.2 Made Ground was found to be variable across the site, with concrete hardstanding overlying a brown silt and gravel layer in trial pit TP1 and TP2 and BH1. The thickness of the silt and gravel was found to vary in thickness from around 0.4m in TP1 and BH1 to only 0.1m thick in TP2.

3.2.3 A layer of spent oxide, clinker and coke gravel was found to be underlying the silt and gravel to a maximum thickness of 0.9m bgl in TP1 and BH1 and to a shallower depth of 0.4m in TP2. Below this horizon, in BH1 the possible base of an old structure was encountered. In trial pit TP2 dark

sands and gravels were encountered below the layer of spent oxide, clinker and coke, while the same sands and gravel were encountered below the historic foundation structure in borehole BH1. The base of the Made Ground was encountered at 1.8m bgl in TP2 and borehole BH1, with natural sands underlying the sands and gravel.

3.2.4 In trial pit TP1 a gravely sand was found to be underlying the spent oxide, clinker and coke horizon. The base of the Made Ground was not encountered due to the presence of unmarked buried pipework.

3.2.5 Olfactory and visual evidence of contamination within the Made Ground was identified at the following locations:

- Within BH1 broken roofing material and brick fragments were encountered at 0.45m – 0.7m bgl. In addition, a bituminous odour was detected within this material.
- Within all excavations, characteristic blue colouration associated with spent oxide was noted, and a related odour was noted in BH1 and TP1.
- Within TP2, between 0.65m and 1.1m bgl, a strong tar/bituminous odour was noted.

Natural Ground

3.2.4 Natural Ground was identified at a depth of 1.8m bgl in borehole BH1 and trial pit TP2. Directly below the Made Ground, a 0.8m thick band of buried topsoil marked the top of the Natural Ground in TP2, in BH1 the buried topsoil was not encountered. Natural Ground in BH1 and TP2 comprised the slightly gravelly occasionally silty sands (possible Folkestone Beds).

3.2.5 No olfactory or visual evidence of contamination was identified within the Natural Ground.

Groundwater

3.2.6 Groundwater within the Made Ground was not encountered during the site investigation. Groundwater in the Natural Ground was identified during the site investigation and subsequent groundwater monitoring in borehole BH1 at a depth of 3.3m bgl.

3.2.7 Olfactory evidence of contamination in the groundwater sample from borehole BH1 was identified in the form of a weak tarry odour.

Buried Structures

3.2.8 With the exception of a demolished brick structure encountered in the shallow Made Ground of BH1, no other buried structures were encountered.

3.2.9 Previous investigations in the general area of the Greenline identified the presence of significant concentrations of cyanides, phenols and PAH

within "below ground tanks and purifiers". However, no such structures were identified in this investigation.

## 3.3 Scheduled Chemical Analyses

3.3.1 A total of 7 soil samples were taken during the excavation of the trial pits, together with 9 samples from the borehole excavation. A selected number of samples were scheduled for analysis comprising the following range of determinants:

- BG Suite; comprising contaminants commonly found on former gasworks and coal carbonisation sites, including – total, complex and easily liberatable cyanides, phenolic compounds, metals (arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc), polycyclic aromatic hydrocarbons (PAH's), ammonia, sulphate and sulphur.

- Total Petroleum Hydrocarbons (TPH); hydrocarbon compounds in the gasoline and/or diesel range – measured where appropriate.

- Volatile Organic Compounds (VOC's) – common organic solvents including BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) compounds associated with petroleum hydrocarbon contamination – measured where appropriate.

3.3.2 From the soil samples collected during the site investigation 7 were scheduled for analysis of the BG suite, with 1 sample analysed for TPH and VOC due to the presence of hydrocarbon contamination within the soil sample.

3.3.3 One soil sample with moderate contaminant concentrations was subjected to leachability tests, with the leachate being tested for the BG suite and total cyanide to a low detection limit of 1 μg/l (to allow comparison to EQS')

3.3.4 Groundwater was sampled from borehole BH1 on 12 March 2001 and analysed for determinants specified in the BG suite. Additional parameters included total hardness, TPH, VOC and nitrate, with free and complex cyanides being analysed to a detection limit of 1 μg/l.

3.3.5 Monitoring of the piezometer installed in trial pit TP2 did not reveal the presence of groundwater within the Made Ground.

3.3.6 All samples were analysed by Environmental Analysis Limited of Hastings, East Sussex. The laboratory appears on the Lattice Property Holdings approved laboratories list.

## 3.4 Scheduled Geotechnical Analyses

3.4.1 A total of 8 soil samples were taken for geotechnical purposes during the excavation of the borehole, with a selected number of samples being scheduled for testing comprising the following range of properties:

- Moisture Content, Particle Size Distribution; and
- <425μm (silt) fraction.

3.4.2 From the soil samples collected during the site investigation, 1 sample was scheduled for Moisture Content, Particle Size Distribution and <425μm (silt) fraction. Due to the ground conditions encountered within the borehole, none of the samples were scheduled for consolidation or triaxial testing (see Section 3.2.9).

# 4 ENVIRONMENTAL ASSESSMENT

## 4.1 Assessment Criteria

Soils

4.1.1 Soil contamination levels are assessed in a two tiered Risk Assessment approach in accordance with statutory guidance. The first tier comprises comparison of measured concentrations to screening criteria produced by the DETR (CLEA). Where such standards are not available, reference is made to alternative criteria such as those produced by the Scottish and Northern Ireland Forum For Environmental Research (SNIFFER) or those produced by RIVM (Dutch Intervention Values). Where relevant to the assessment, assumptions made in any alternate criteria are detailed herein.

4.1.2 The second tier comprises the further characterisation of the aforementioned criteria using site-specific factors followed by comparison with Dutch Human Toxicological values, where available (see Table 4.1 and discussion below). This is undertaken in order to assess the risk (non-statutory) to site workers and future site users.

Leachate Tests

4.1.3 Leachability studies were undertaken to assess the leaching potential of contaminants. The advantage of the method is that in combination with measured total contaminant concentrations in the soil they give an indication about the concentrations readily available to the infiltrating soil water, thus quantifying the mobile and immobile contaminant fraction.

Groundwater

4.1.4 Groundwater assessment is undertaken in a tiered approach in accordance with Environment Agency R&D Publication 20 ("Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources"), with results given in section 4.3. Contaminant concentrations found in the groundwater are compared to a set of screening criteria in each of the assessment tiers.

4.1.5 The hydrogeological and geological properties of the site indicate that both groundwater and surface water are environmentally sensitive receptors of ground and groundwater contamination potentially present on site. With the surface water environment of the East Lake and Moor Wood located in close proximity to the site and the underlying Folkestone Beds classified as a Major Aquifer, both Environmental Quality Standards (EQS) and Drinking Water Standards (DWS) were adopted in this report as the relevant screening criteria for groundwater contamination.

## 4.2 Quality Control

4.2.1 The data collection, storage and preparation of this report has been undertaken in accordance with PB's Quality Management System which operates within the standards outlined in ISO 9001 (BSI Certificate No. Q06143).

4.2.2 All sample analyses have been undertaken by Environmental Analysis Ltd in accordance with quality control procedures specified in Project Mayflower Guidance Document (August 2000/V6).